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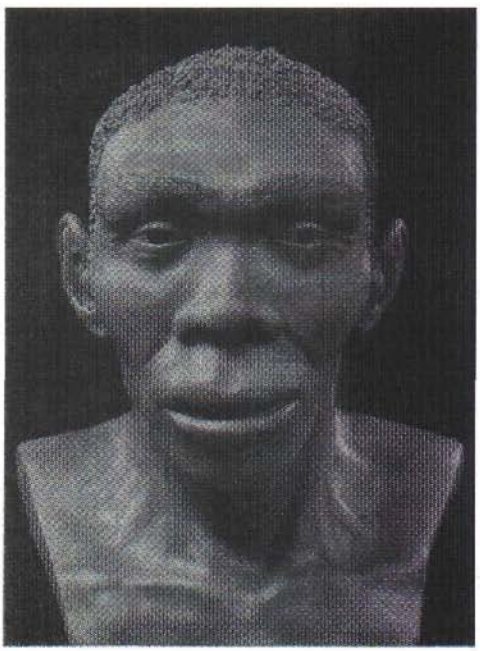

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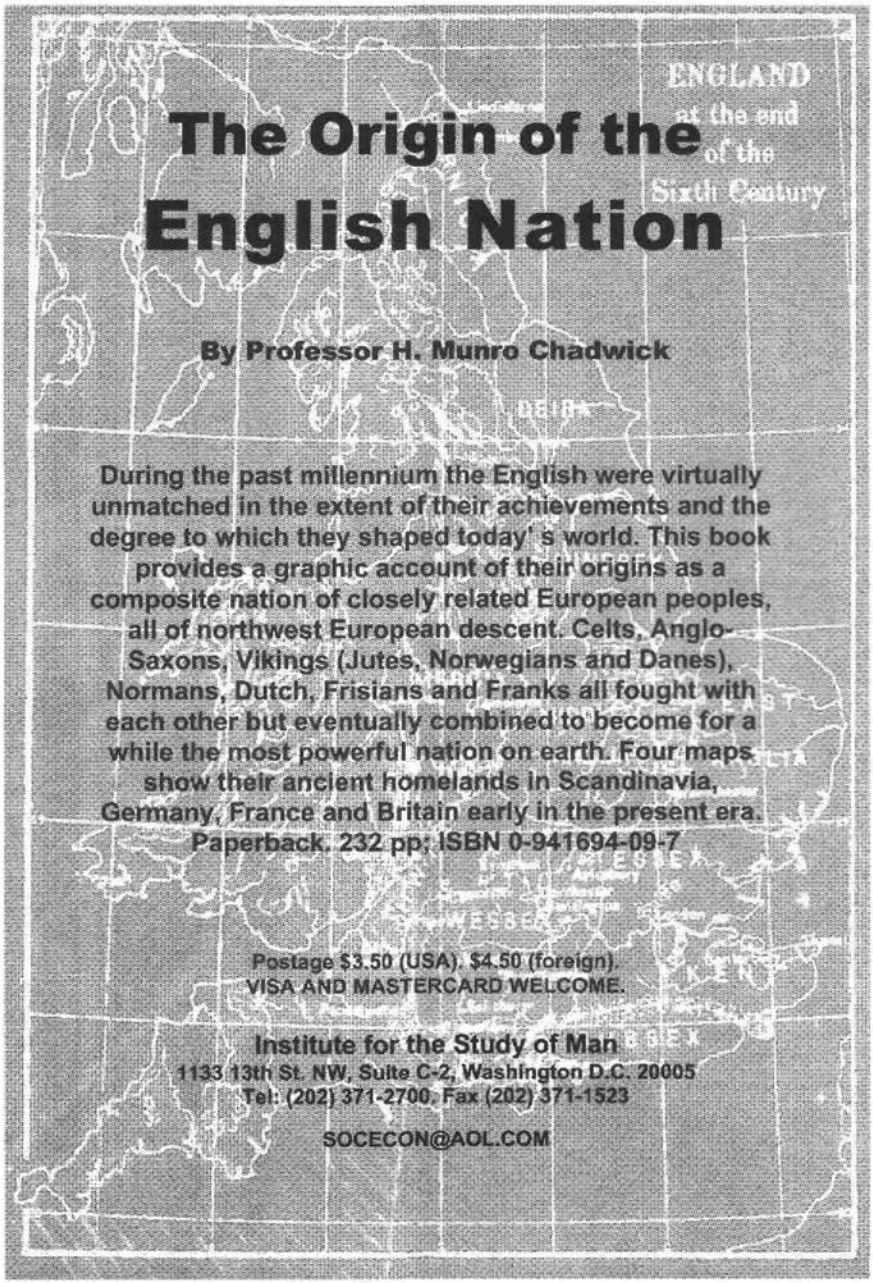

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Cover Picture: Reconstruction from a skull found at Broken Hill in Zambia, dubbed Rhodesian Man. This has been dated circa 40,000 B.P., well after the ancestors of the progenitors of modern Europeans, Asians and Amerindians are believed to have migrated "out of Africa," which movement or series of movements is assumed by various proponents to have taken place between 200,000 and 120,000 B.P. (See articles under Debate on Race)

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Skeletal Age Determination of the Symphysis Pubis for Forensic Purposes: Analysis of an Iraqi Series

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Skeletal age determination from the symphysis pubis of a series of (17) male and (11) female hip bones was done. Three methods were used and the bone age estimated by each was compared to the documented chronological age. The methods used were Todd's, McKern-Stewart's, and Suchey-Brooks'. The results of statistical analysis were discussed and showed that best estimation of age and correlation with chronological age was achieved by the cast method of Suchey-Brooks. It is concluded that the use of this method in anthropological and forensic studies is strongly advocated.

Key Words: Symphysis pubis, forensic anthropology, estimating skeletal age, male/female differences

Introduction

Age-related changes of the pubic symphysis have gained wide Acceptance among physical anthropologistsand in forensic medicine as one of the basis for estimating adult skeletal age. The symphyseal surface or face can be stated to be a modified diaphyseo-epiphyscal plane and, as such, may be expected to show metamorphosis, if not actual growth, as an age feature. The first extensive study on the use of symphysis pubis as age indicator was performed by Todd in 1920 who established ten pubic symphyseal phases with an age range of 18-50 plus years (Todd 1920, 1921, 1923). Age limits for the pubic symphysis by Todd's method had been modified for age above 25 year (Brooks 1955). Later on, a new method of age estimation have been proposed in which symphyseal metamorphosis is evaluated

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in terms of combinations of its component parts. Three component have been described, each subdivided into five developmental stages which, when combined as a formula for any pubic symphysis will yield an age range and the probable Stewart 1957).

Todd's phase technique and the component analysis of McKern and Stewart were reanalyzed and it was observed that Todd's method was more reliable than the other (Angel et al. 1986). Both the Todd and the McKern-Stewart systems did not account for age variability seen in advanced pubic bone patterns (Krogman and Iscan 1986), certain bony traits in each system were collapsed due to ageing process of the joint and a modified system was introduced (Katz and Suchey 1986). The traditional Todd's system and the modified system are found to be good systems. The age of the individual (Mckern and integrated modified system, called Suchey-Brooks system, was developed and seemed to give the best estimates (Klepinger et al. 1992).

The pubic symphysis shows sexual dimorphism. Thus, the evaluation of the pubic symphysis should be qualified sex-wise. Male standards are sex specific and are not applicable to the female os pubis (Suchoy 1979). Standards for female were based on the components that McKern and Stewart introduced for male (Gilbert and McKern 1973).

Most of the studies on the symphysis pubis were performed on American and aboriginal American and aboriginal American Indian specimens. Only few studios have been done on Asians these being limited to Japan (Hanihara 1952), (Pal and Tamankar 1983).

In Iraq, no previous studies have been done on Iraqi specimens using the symphysis pubis as an age indicator. Although racial differences are not so important in Iraq, it seems very important to standardize the various systems for age determination from the symphysis pubis on Iraqi specimens to refine a ready and standard method for age determination from the symphysis pubis of these specimens and to find the superior method in forensic applications.

Materials and Methods

All the hip bones used in this study were taken from the Department of Human Anatomy Saddam College of Medicine. These bones have a documented age from the death certificate.

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Preparation of the bones:

The hip bones were carefully disarticulated by detachment with sharp dissection, the maximal amount of soft tissue were removed using blunt dissection. Maceration was done by putting the specimens in a water bath at 95 c to which strong alkali was added (1:10 NaOH or K0H), for two hours. As the tissue is spftened it is pulled away with the forceps. Bleaching was done by immersion in hydrogen peroxide for 72 hours. Degressing was done by tricholoroethyline in a fume cupboard., Care was taken not to damage the symphyseal face of the pubic bone.

Those specimens which fragmented during processing were eliminated from the study.

Male os pubis:

Seventeen male hip bones were collected and using three systems:

1 Todd's system: the symphyseal surface of each bone was evaluated and studied as a whole and one of the ten phases of Todd's system was designated. A range of age was determined and the mean was selected as the age of the specimen (Todd 1920).

2 McKern-Stewart system: the symphysis pubis was studied in three components, each component was evaluated and a score from 0 to 5 was given to each component according to the developmental stage. The total score of the three component was assessed according to a standard table and a range of age was determined and the mean was selected as the age of' the specimen (McKern and Stewart 1957).

3 Suchey-Brooks system: casts of the six phases of this system were used to determine the age of the specimen. The mean age of the allocated phase was chosen (Katz and Suchey 1986).

Female os pubis:

Eleven female hip bones were collected and blindly evaluated for age using the same methods used for the male hip bones except that we use Gilbert-McKern system for evaluating the components of the symphysis pubis instead of the McKern-Stewart system. The total score of the three components was assessed and a range of age was determined and the mean was selected as the age of the specimen (Gilbert and McKorn 1973).

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Statistical analysis:

The reference value of ago was regarded as the ago obtained from the death certificate (item No. 7, date of birth), and referred to as documented age. Pairs (X, Y) of the documented age (X) and determined age by a particular method (Y) were subjected to analysis. Regression analysis was done to calculate the regression coefficient, its standard error, and the F- value for level of significance. Least square method was used to get the correlation equation as the best fitting straight line and its intercept. The coefficient of correlation was determined to nature and strength of correlation between (x) and (y).

Results

In all the hip bones studied, ossification nodules were very rare and it was only seen in one male specimen.

Male hip bones

Regression analysis of the data obtained by the three systems was done. The trends of these methods are shown in fig. (1).

1 Todd's method: this method has a regression coefficient of 0.98(±0.1) with a correlation coefficient (r) of 0.92.

2 McKern and Stewart method: the regression coefficient is 0.52 (±0.05) with a correlation coefficient (r) of 0.93.

3 Suchey-Brooks method: the regression coefficient is 0.99 (±0.08) with a correlation coefficient (r) of 0.94.

Female hip bones

Regression analysis of the data obtained by the three systems was done. The trends of these methods are shown in fig (2).

1 Todd's method: the regression coefficient is 0.93 (±0.05) with a correlation coefficient (r) of 0.98.

2 Gilbert and McKern method: the regression coefficient os 0.62 (±0.09) with (r) value of 0.91.

3 Suchey Brooks method: the regression coefficient is 0.92 (±0.07) with (r) equal to 0.97.

The statistical analysis of the data obtained by the three methods in both sexes is demonstrated in table (1).

Discussion

Statistical analysis of male and female series are different and the standards for each group should thus be separated.

In the scatter diagrams (fig. 1 and 2), these points are

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confined to an elliptical area where the major axes are the trends. In the case of the Todd and Suchey-Brooks methods for male and female, there is some deviation from linearity and the ellipses being long and thin with correlation coefficient (r) slightly below +1. The ellipse widens in the case of Gilbert and McKern method for females. Todd and Suchey-Brooks methods appear to be the best for age determination for both male and female. The relation between the documented age and the calculated age by these methods is positive, which signifies high correlation. Suchey-Brooks method was found to be superior in forensic application for both male and female os pubic (Klepinger et al. 1992).

The coefficient of determination (r2) in the linear regression model is the proportion of the total variation that can be explained by the linear relationship existing between the documented and calculated age (Johnson and Leone 1977). In male series, the Suchey-Brooks method accounts for the most variation (0.89), while in female series it is Todd's method (0.96) and Suchey-Brooks (0.95) which account for most variation (table 1). The rest of the variation is due to unexplained factors and can be called experimental error (Johnson and Leone 1977).

The least square method for regression analysis gives an equation of a straight line:

$$Y = a + Bx + E$$

(a) is the intercept. This makes Gilbert and McKern method for female applicable after the age of 12 but not earlier. Also, the McKern and Stewart method for males is applicable after the age of 10, while the other two methods (Todd and Suchey-Brooks) are applicable at earlier ages. However, these are mere statistical extrapolation and do not mean that anatomical differences exist before the age of 10; this point should be examined from the anatomical and developmental point of view, but generally, it is unsafe procedure to extrapolate from regression equations outside the observed range (Zar 1984).

(b) is the slope of the regression and it is the regression coefficient. Its value is just below one for the Todd and Suchey-Brooks methods (for male and female) which means that these methods underestimate the age slightly. In the case of McKern and Stewart for male it grossly underestimates the age by about

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one half (table 1), especially after the age of 40 (fig. 1). The Gilbert and McKern methods for female also tend to underestimate the age by about one third. All these methods tend to underage (Meindl et al. 1985), but in this study we find that the Todd and Suchey-Brooks tend to underestimate the age more when used for female os pubis than male.

The F values for each method obtained by using ANOVA, are found to be highly significant (<0.005) for all systems used for male and female. The highest value for F is found in Todd's method for female, (255.55). The value of F in the Suchey-Brooks method is 122.73 for male and 161.91 for female. These values indicate that sampling does not affect the result and they are real and highly significant differences.

The use of the cast technique has been advocated by many authors as the best method for application (Kleppinger et al. 1992). We have used the cast of Suchey-Brooks' system and it seems the best method for its easy use. It is also the best applicable method in forensic practice. The Suchey-Brooks cast method appears to be the best for male and female practical age determination and we recommend its use in forensic practice with the following equation:

male: documented age = 0.42 ± 0.99 (estimated age) ±0.09

female: documented age = 2.93 ± 0.92 (estimated age) ±0.07

ACKNOWLEDGEMENT

We are grateful for the statistical assistance provided by Mr. R. Al-Salihi and Dr. J.M. Suchey for providing us with valuable literature on the subject.

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Sex	Male			Female		
Method	*Todd*	*McKern & Stewart*	*Suchey & Brooks*	*Todd*	*McKern & Stewart*	*Suchey & Brooks*
Regression coefficient	0.98	0.52	0.99	0.93	0.62	0.92
Standard error	0.1	0.05	0.08	0.05	0.09	0.07
Intercept	-0.34	9.82	0.42	2.01	12.28	2.93
F	82.73	101.32	122.73	255.55	41.41	161.91
Correlaion coefficient (r)	0.92	0.93	0.94	0.98	0.91	0.97
Coefficient of determination (r^2)	0.84	0.87	0.89	0.96	0.82	0.95

Table (1): Statistical analysis of the observed data in both sexes by the three methods of age determination in the symphysis pubis.

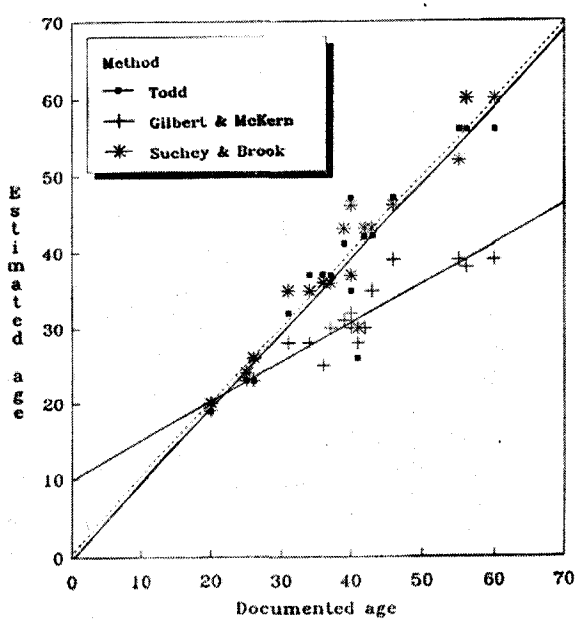

Fig.(1): Regression of estimated age (year) of male hip bones on documented age (year) by the three methods used

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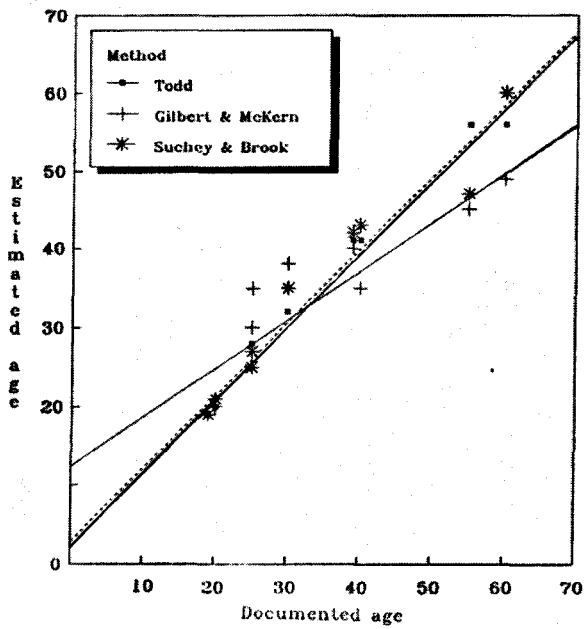

Fig.(2): Regression of estimated age (year) of female hip bones on documented age (year) by the three methods used

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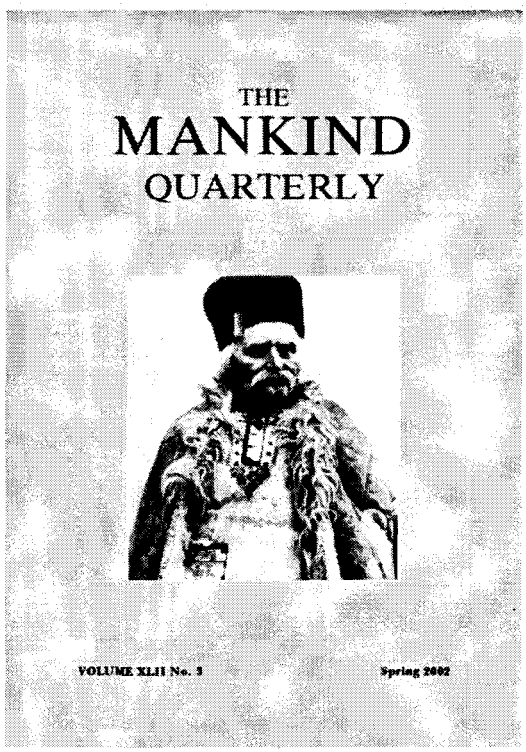

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DEBATE ON RACE

The Scientific Fallacy of the Human Biological Concept of Race

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The authors provide a detailed presentation of the arguments commonly advanced to support the claim that the term "race" does not represent a useful scientific category. Their argument is supported by an extensive bibliography of selected texts.

Key Words: Physical anthropology, forensic anthropology, evolution, Linnaeus, Darwin, Broca, Blumenbach, Carleton Coon, Cavalli-Sforza, F. Boas, Margaret Mead, Ashley Montagu, R. Lewontin, S. J. Gould, L. Lieberman, dismantling race, nazi-fascist racism.

A Wrong Approach

Modern science try to understand the phenomena of nature through the formulation of hypotheses and their subsequent empirical control by comparing predictions and observations. If a scientific hypothesis receive the empirical validation then it become part of the construction of a paradigm; otherwise, the hypothesis must be simply rejected if falsified by experimental results (Popper 1934; Kragh 1987). That was not the case of the construction of the "anthropological dogma" of human biological concept of race. Physical anthropology originated as an independent scientific discipline during the eighteenth century, and has been affected by an epistemological error from the very beginning. In fact, the existence of races was considered the basic principle of physical anthropology instead of just being a hypothesis amenable to empirical investigation, and therefore for about two centuries physical anthropologists refused to be led by the only criterion of truth that natural sciences recognize, namely empirical validation. However, all scholars who

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dedicated themselves to that futile classificatory exercise unintentionally contributed to demonstrate that they were involved in a false paradigm, because of the problematic aspects in explaining human biological variability using the taxonomic sub-specific category of race. This difficulty in identifying human races was proved by the high number of subdivisions suggested, which included two to sixty-three races, and differences in the traditional definition of race: Race as synonymous of sub-species, ethnic group, population, and so on (Darwin 1871; Count 1950; Biasutti 1967; Gould 1981; Brace 1982).

Why did so many physical anthropologists refuse to test the hypothesis of whether human biological variability could be neatly subdivided according to the taxonomic sub-specific categories of race? Why did so many physical anthropologists accept the racial paradigm? Three main constrains, two external and one internal to the scientific process, contributed to this serious error in scientific logic. First, the history of the cultural context from which physical anthropology originated. Second, the history of the social context in which physical anthropologists formulated the concept of race. Third, the broad process of construction of theories within Biological Sciences.

The Cultural Context which Conditioned Physical Anthropologists

The first reason emerged from a western culture idea that biological and ethnic diversity is very ancient. This concept developed in Egypt during the second millennium B.C., and represented a deep change in perspective. In fact, before then not only humanity but the whole world was considered as a unit. The Egyptians subdivided humankind into four groups, one of which was made up by themselves. They in fact called themselves Remet which simply means "man". In their paintings of the fifteenth century B.C. they were portraid in red, while the Asiatics named Aamu in yellow, the populations of sub-Saharan Africa, the Nubians named Nehesyu, in black, and the Libyans, as well as some western populations named Tjemehu, with yellow hair and blue eyes (Bresciani et al. 1993; Gardiner 1947). Still in ancient times, the father of history Herodotus (490/480-430/420 B.C.) gave a physical description to a great number of people in his *Historíe*, and Pliny the Elder (23-79) in his *Naturalis historia* explained physical differences between Africans and

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Europeans as a direct consequence of climate. After Herodotus all long-distance travellers, up to the origin of physical anthropology, left descriptions of the peoples they met (Daumas 1957; Duchet 1971; Geymonat 1973). A classic subdivision of humankind was reported in the Bible, which dominated western culture during the Middle Ages and part of modern times. Chapters ten and eleven of the Genesis describe the origin of populations as descending from Noah's sons and their dispersion: Shem was the ancestor of Semites (Arabs and Hebrews), Ham of Hamites who populated southern-western regions of the world, i.e. Africa, and Japheth of Aryans or Indo-Europeans. However, the Bible not only subdivides humankind it also contains a curse against Ham, the sun of Noah who is considered the ancestor of the African populations (Genesis, 9, 24-27). It is clear that the troubles for the African populations began very early.

During the Renaissance (fifteenth and sixteenth centuries) psychological types and their classification, besides physical (mainly anatomical) differences, became again popular[3] and assumed great importance. According to Burke (1993:192):

> Classical views of the physical constitution of man, and the distinction between four personality types (choleric, sanguine, phlegmatic and melancholy), were taken seriously by writers in this period, and they are not without relevance to the arts.

In fact, as an example, on the theme of the four personality types Albrecht Dürer (1471-1528) dedicated in 1526 a painting entitled the Four Apostles (Alte Pinakothek, Munich). Each of the four panels portrays an Apostle and an Evangelist typifying the four humours: St John as the sanguine, St Mark as the choleric, St Paul as the melancholic, and St Peter as the phlegmatic (Murray and Murray 1993:201). This subject was used later by Linnaeus in his racial classification.

The Social Context which Conditioned Physical Anthropologists

The second reason was related to social and ideological conditioning of physical anthropologists when western societies justified slavery, colonialism, and discrimination (Montagu 1952; Livingstone 1962; Mead et al. 1968). In that period it was

[3] Views of the distinction between psychological types came first from a text attributed to Aristotle.

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essential for a civil society to find a moral justification for immoral behaviours and nothing was more propitious than a "scientific" demonstration that the observable physical differences, i.e. racial differences, were associated to intellectual and moral differences. Many attempts were made to state biological determinism and the superiority of some races over others. So it was a natural right, and also a duty, for the so called "superior races" (of course Europeans and European-Americans) to dominate. Montague Francis Ashley Montagu (1952) and Kenneth Adrian Raine Kennedy (1976) quoted a long list of such European and European-American degenerated ideas although they did not come from physical anthropologists.

In Italy, during fascism and its policy in acquiring colonies, for the most part in Africa, physical anthropologists devoted many efforts to support racist positions. The most zealous was certainly Lidio Cipriani (1892-1962), who wrote the following nonsense just before the attack of fascist Italy against Ethiopia in 1935 (Cipriani 1935):

> Within negroes races, mental inferiority of women is very close to mental deficiency; moreover, at least in Africa, some female behaviours are not human, and resemble animal behaviours (p. 181). [...] As far as brain of negroes is concerned, [...] its morphology is scarcely comparable to the less developed brain of some European women. On the contrary, [...] very clever Caucasian men show an increase in the brain volume and a different morphology, mainly in the temporal lobe, than other populations (p. 184).

It is interesting to note that in 1909 Franklin Paine Mall (1862-1917) had already demonstrated that there were no differences in human brains according to race (quoted in Mukhopadhyay and Moses 1997, note number 3). The ideological role that these statements were to play in terms of social control in fascist Italy on the eve of the Ethiopian War was made manifest by the definition of race that Benito Mussolini (1883-1945) gave only three years earlier to Emil Ludwig [pen-name (1881-1948) 1932:73]: "Race: this is a feeling, not reality". Therefore, before the attack to the Ethiopians was planned Mussolini denied any biological basis of the concept of race

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(Ludwig 1932:73).[4] Besides, at the beginning of the 1960s Cipriani changed his thought on the subject and became rather cautious (Cipriani 1962:25,26).[5] Racist assertions like those stated by Cipriani were strongly rejected by physical anthropologists free from any social and political prejudices, but above all by those interested in scientifically strict reasoning. After World War II the scientific community of physical anthropologists rejected the causal linkage between biology and mental capacity, a fundamental premise for the hierarchical evaluation of races, and the social-political dominance of the so called "superior races". This anthropological view was not new because Darwin had already specified (1871) that there was much similarity in mental traits between races. Besides, more recently this position was clearly articulated for public consumption in several documents: The statements drew up at UNESCO's House in Paris of July 1950 (I. Statement on race), June 1951 (II. Statement on the nature of race and race differences), and September 1967 (IV. Statement on race and racial prejudice); The proposal drew up in Moscow of August 1964 (III. Proposals on the biological aspects of race); The UNESCO "Declaration on Race and Racial Prejudice" adopted by the General Conference at its twentieth session in Paris, 27 November 1978; The document proposed by the International Institute for the Study of Man (Chiarelli 1995a, 1995b, 1996);[6]

[4] "Of course, pure races do not exist any longer, not even Jewish race. But, exactly, from right mixtures often derives strength and beauty to a state. Race: this is a feeling, not reality; 95% feeling. I do not think that it is possible to prove whether or not a race is biologically pure. [...] The national pride does not need at all the frenzy of race".

[5] Comment to Bielicki's article (1962): "I wish only to make the point that all types of research directed at establishing inter-population relationships, no matter how conducted inevitably result in deductions that are provisional until new light is available from general biology". And comment to Wiercinski's article (1962): "I consider aleatory most of the analysis concerning ethnogenesis".

[6] The document on race proposed by the International Institute for the Study of Man – The reappearance of a subversive and confused concept of race and the artificial ethnic differentiation promoted by cultural, religious and political circles is misleading and dangerous for the present state and hope for worldwide integration of humankind. The International Institute for the Study of Man with this declaration intends to clarify: a. that the physical differences among human beings, apart from the differences related to sex and age, are due to environmental adaptations developed during 3 or more million years of the evolution of our species; b. that the cultural and religious differences which are the basis for the ethnic barriers are related only to the life of the individual and to the cultures in which the individual has been imprinted and raised during his early years of life.

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And the American Association of Physical Anthropologists position to update the 1964 proposal (AAPA 1996). On the subject a very popular book by Theodosius Grigorievich Dobzhansky (1900-1975) entitled Genetic Diversity and Human Equality was published in 1973 and, more recently, Luigi Luca Cavalli-Sforza, Paolo Menozzi, and Alberto Piazza (1994:19-20) stated:

> There is no scientific basis to the belief of genetically determined "superiority" of one population over another. None of the genes that we consider has any accepted connection with behavioral traits, the genetic determination of which is extremely difficult to study and presently based on soft evidence. The claims of a genetic basis for a general superiority of one population over another are not supported by any of our findings.

Such efforts to dismantle racist ideologies demonstrate how deeply influenced was the popular and intellectual way of looking at human biological variation and how human behaviour was affected by the ideological construction elaborated by physical anthropology between the nineteenth and the first half of twentieth century. However, in our opinion, the concept of race must be rejected not for its misuse for political reasons, but because many decades of scientific research has demonstrated that it is scientifically misleading in evaluating human biological variability.

The Scientific Construction of the Concept of Human Biological Race

The third reason was due to the peculiar situation of biological research in the eighteenth century. The discovery of the Americas, geographically far from the rest of the world, made seventeenth century Europeans aware of a great number of new species of plants and animals. This sudden increase of knowledge about biological variability contributed the importance of classification as a scientific tool. Classifications became the essential tool for ordering and then studying variability. Until than, classifications had not been utilized, and in naturalistic studies only the medical properties of the plants used in botanical pharmacology were reported. On the contrary, from that moment onward, taxonomy became the fundamental tool of biology and of other naturalistic sciences. It was also

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believed that classifications would have been able to clarify the model of organization of the world. Therefore, it was stated that biological studies had to be devoted to naming plants and animals and finding out the relationships between them (Rossi 1997). Moreover, it became clear that biological diversity within each species was important and therefore taxonomists introduced sub-specific categories to better classify variability. Differently from what had happened during the Middle Ages, in such a scientific climate humankind started to be physically examined through the same technical and theoretical levels reached by biology in the Age of Enlightenment which were also applied to the study of all other living beings. Also human biological variability, including the variability of native American populations which were unknown until then, was erroneously classified into races. Therefore, human racial classifications were not only the result of social-cultural conditioning, but also of a scientific trend. However, it is important to note that the use of human racial classifications was not accepted by all scholars. Different scientific ideas were proposed by Johann Gottfried von Herder [(1744-1803) 1784-1791] and Samuel Stanhope Smith [(1750-1819) 1810; quoted in Greene 1959] who were against the use of racial classifications in anthropology, but unfortunately not followed by physical anthropologists.

A peculiar position was taken by Charles Bonnet [(1720-1793) 1781:130], who did not propose any racial classification although he accepted the concept of race, or variety. He gave great importance to the variability not only of our species but also of each population:

> The trend of nature is uniform, and humankind has its gradation, as everything in the world. [...] If you consider all the nations of the world and look at the people of the same Reign, or Province, or City, or Quarter, or even of the same family you would recognise as many different types of people as many individuals you can see.

It was a mistake to use human racial classifications although during the Age of Enlightenment they contributed to enlightening "Man's Place in Nature":[7] An animal species within all other animal species. After many centuries rational thought

[7] To use the title of the famous book by Thomas Henry Huxley (1825-1895), published in 1863.

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started to prevail again over metaphysics, particularly the biblical tale. As in classical philosophy, humankind was studied as an animal species, and was not considered as an exception within living beings. Indeed, Aristotle in his *Historia* animalium placed humanity at the top of animal kingdom, and considered it as the most perfected species. This position is quite different from the position stated by Christianity: The man was created in the image of god. Also today the Catholic Church states the ontological leap.[8]

The debate on human racial classifications was reinforced by the discussion on human monogenism and polygenism. Biblical anthropology maintained monogenism or the unity of the origin of humankind, sanctioned by Augustine (354-430) in his *De civitate Dei*, for creationistic belief and not for empirical validation of the hypothesis. On the contrary, laic and positivist anthropology which was then becoming popular, supported polygenism, a different origin of human populations. Polygenism was the rational, yet erroneous answer to the discovery of native Americans. In fact, they thought that these populations, who had been living in a continent far from the Old World, could not have had the same origin as the rest of humankind. At that time, such an idea was rather common. In fact, there were not historical records on the existence of the American continent, moreover the earth was thought to be very young. The question to be answered was: How could so many physical "types" originate in so few millennia, given the short history of humankind? Thedebate became particularly bitter in the nineteenth century when Paul-Pierre Broca (1824-1888), strong supporter of polygenism, abandoned the Société de Biologie which was against this theory and in 1859 founded the *Société d'Anthropologie* of Paris. Between 1859 and 1893 this new association, positivist, materialistic and anticlerical was the model for other anthropological societies which rose both in Europe and in the United States.[9]

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[8] See the paragraph "Humankind in the biological classification".

[9] London 1863, Berlin 1869, Vienna 1870, Florence 1871, Stockholm 1873, Washington 1879, Rome 1893. In 1882 Physical Anthropology was included into the American Association for the Advancement of Science. In Florence the *Società italiana di Antropologia* (with its journal *Archivio per l'Antropologia e l'Etnologia*) was founded in 1870 by Paolo Mantegazza (1831-1910), who stated human monogenism. The second father of the italian biological anthropology, Giuseppe Sergi (1841-1936) supporter of polygenism, left the Florentine institution and

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The contrast between monogenism and polygenism has been overcome. Modern anthropology has demonstrated that humankind has had a common evolutionary history and that, at the basis of our origin, there is not a founding couple, the idea proposed by creationists, but a population belonging to a species different from ours, and whose evolutionary changes, typical of anatomically modern humans, have occurred in a short period of time.

Humankind in the Biological Classification

The first modern attempts at classifying human biological variation were given in the seventeenth century by François Bernier [(1625-1688) 1684], who classified humankind into four groups and by Richard Bradley [(born at the end of the 17th century-1732) 1721], who subdivided our species into Whites (Europeans and Americans), Negroes (Abyssinians and Negroes), and Intermediate (Mulattoes), thus disregarding all Asiatic populations.

But it was only during the next century that the first scientific subdivision of modern humans into races was made by the father of biological taxonomy: Karl af Linné (Linnaeus 1707-1778), who extended the Latin binomial nomenclature to animals and minerals. This nomenclature had been introduced in the field of Biology by Kaspar Bauhin (1560-1624) in order to classify plants (Kennedy 1976). Following the medieval scholastic philosophy, Linnaeus was a convinced supporter of the monophiletic origin of humankind, and in 1735 he first called our unique species *Homo sapiens*, with four varieties: *Europaeus albesc., Americanus rubesc., Asiaticus fuscus* and *Africanus niger*. He was undoubtedly biased by the renaissance theory of temperaments which used to define Europeans as sanguine, Native Americans choleric, Asiatics melancholic, and Africans phlegmatic (Linnaeus 1789; Daumas 1957). As Panofsky (1943) suggested, the theory of the four temperaments implied a hierarchy, so when Linnaeus coupled what the renaissance culture considered the noblest humours to Europeans and Asiatics, he banished Americans and Africans to the lowest level of his racial hierarchy.

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founded in Rome in 1893 the *Società Romana di Antropologia*, named in 1937 *Istituto Italiano di Antropologia*, (with its journal *Atti della Società Romana di Antropologia*, named in 1911 *Rivista di Antropologia*).

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Even though Linnaeus was a follower of creationism, he achieved an "evolutionary" purpose: he recognized biological variability which characterizes the species and created the sub-specific taxonomic category named "variety". Moreover, he included the genus Homo in the order of Anthropomorpha. In such a way, the advent of modern Biology freed humankind from the biblical destiny of "special creature". But the contrast between rationality of scientific thought and the biblical metaphysics on the nature of humankind is not yet over. In his recent message to the Pontifical Academy of Sciences,[10] dated 22 October 1996, Joannes Paulus II accepted the biological theory of evolution but on humankind he stated yet (point n. 6):

> With man, then, we find ourselves in the presence of an ontological difference, an ontological leap, one could say. However, does not the posing of such ontological discontinuity run counter to that physical continuity which seems to be the main thread of research into evolution in the field of physics and chemistry? Consideration of the method used in the various branches of knowledge makes it possible to reconcile two points of view which would seem irreconcilable. The sciences of observation describe and measure the multiple manifestations of life with increasing precision and correlate them with the time line. The moment of transition to the spiritual cannot be the object of this kind of observation, which nevertheless can discover at the experimental level a series of very valuable signs indicating what is specific to the human being. But the experience of metaphysical knowledge, of self-awareness and self-reflection, of moral conscience, freedom, or again, of aesthetic and religious experience, falls within the competence of philosophical analysis and reflection, while theology brings out its ultimate meaning according to the Creator's plans.

The term race appeared in scientific literature only in 1749 thanks to Georges-Louis Leclerc comte de Buffon (1707-1788) who changed it from the Linnean term variety (Buffon 1749-1804). He stated that humankind is one species with six races, and hypothesized environmental influences on their mechanism of origin (Buffon 1749). However, it was Johann Friedrich

[10] *L'Osservatore Romano*, Weekly edition in English, n. 44 (1464), 30 October 1996.

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Blumenbach (1752-1840) who greatly influenced the future thought of physical anthropology with his doctor of medicine thesis *De generis humani varietate nativa* from the University of Göttingen in 1775. The book was very popular, mainly the third revised edition published in 1795, which is considered the promoter of the new science of physical anthropology. Blumenbach stated that humankind is made up by one species with five races. He took humanity off the Linnean order of *Anthropomorpha*, and created the order of Bimanus. Moreover, he coined the term *varietatis Caucasiae* (Caucasian or Caucasoid) for populations of European origin, from a cranium of his osteological collection which belonged to Georgian Caucasus. According to Blumenbach the shape of the cranium represented the European "type" of head. Similarly, he described other four crania to be the ideal shape to fit the various races of his classification.

It was thanks to Blumenbach that the shape of the cranium, and therefore the shape of the head, received great attention in human racial classifications, and the publication of catalogues of human crania, preserved in osteological collections, became common. The interest for head morphology also increased in relation to the success of the ideas of a new pseudo-science, phrenology. Its founder Franz Joseph Gall (1758-1828) thought that psychical functions of individuals were determined by the brain and cranium anatomy (Gall 1825). The idea that human behaviour was correlated to human physical characteristics influenced anthropology to the point of becoming the essence of the concept of race.

The last human racial classification dating back to the Age of Enlightenment was suggested by Immanuel Kant (1724-1804) who, in 1785 and 1798, listed four races.

The Chronology of Life

The eighteenth century thought was characterized by the contradiction between the monogenism, the existence of human biological races, and the Christian chronology of the origin of the world which fixed its age at a few thousand years. The first "rational" calculation of the age of earth was made by the Irish clergyman James Usher (1581-1656), Archbishop of Armagh. Usher stated the date of the Creation to be October 23, 4004 B.C., and the date of the creation of man six days later: 28 October (Usher 1650:1). Moreover, the English clergyman John

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Lightfoot (1602-1675), Vice-Dean of the University of Cambridge in 1654, calculated that Adam was created at 9 o'clock a.m. (Lightfoot 1642:4) and that the date of the Deluge was 2348 B.C., i.e. 1656 years after the Creation (Lightfoot 1647:7, 10). These calculations were made according to the reconstruction of the Old Testament, using the genealogies reported in the Bible.

The young age of the earth was not in accordance with the fifteenth century B.C. paintings on the Egyptian tombs, which already represented morphological differences of humankind. One is then bound to ask how could the diversification of human biological races have occurred in a couple of millennia? In such a scientific climate, polygenism, supported by several authors, seemed to be more consistent with the earth chronology of the time.

Only towards the end of the eighteenth century the idea that the earth was much older gained consistency. In 1778 Buffon shifted the origin back to about 75.000 years B.P., and James Hutton (1726-1797) in 1795 stated that an indefinite span of time was needed to produce the land which then appeared. Hutton's thesis was shared by Charles Lyell [(1797-1875) 1830] who contributed to the decline of Christian chronology. During the nineteenth century, it was stated that the age of the earth was to be set even further back: Not less than many million years. Now we know that the earth originated some thousand million years ago (Dalrymple 1991). As a consequence, the idea of a very ancient earth gave rise to the idea of antiquity of living beings, and after this back-shift in time, polygenism lost efficacy as a tool for investigating the biological evolution of humankind.

The Morphological Approach to the Concept of Human Biological Race

Until the first decades of the twentieth century a classification involved morphological features such as measurement and description, or anthropometry, reaching a highly sophisticated level. The main interest was to evaluate the connection between brain size versus intelligence. Craniometry was not developed to examine whether there were differences among human races, for physical anthropologists were sure of it, but to examine the scientific basis of the differences thought to exist among human races. Broca was one of the most

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distinguished scholars involved in that kind of studies, who stated the causal relationship between brain size and intelligence. Louis Pierre Gratiolet (1815-1865) instead, maintained that intelligence was related to the age of obliteration of cranial sutures (Quattrone 1998).

In the eighteenth century Peter Camper [(1722-1789); quoted in Greene 1959] defined the first parameter to qualitatively evaluate physical characteristics: the prognathism angle, a measurement of the degree of facial projection. During the following century, Broca introduced the statistical method. The impression of precision in generating classifications of races was reached when anatomist Andres Retzius (1796-1860) used head dimension to define the cephalic index, which was putatively considered stable and therefore a good racial indicator. But efforts to develop more elaborate anthropometric techniques to make human racial classifications objective persisted into the twentieth century as, for example, the spectrometric measure of skin colour.

The limitation of morphological characteristics is due to the impossibility to discriminate between the contribution of genes and environment in forming their phenotype. It follows that those traits are not suitable to clarify the relationships between the various groups. In fact, in order to have a naturalistic value, a classification must rely on a network of ancestor-descendant relationships, i.e. the more populations resemble each other, the closer the point in time when they diverged from a common ancestor; in other words, the evolutionary path covered together is longer. It is obvious that for such studies one needs characteristics with well known genetic bases and on which the environment does not act; otherwise, we would measure the similarities between the environments in which the human populations live instead of their phylogenetic relationships. Skin colour, colour and shape of eyes and colour of hair, shape and size of body and head are under strict and direct environmental influences and tend to adapt themselves to the specific environment in which they live. This is why they are the best features to trace our ecological history and to help us understand the geographical typologies of humankind that were once used to define human races. To put it in a simpler way, populations that live in a certain geographical environment are more similar morphologically, even though they do not share a

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common phylogenetic history.

Doubts on the Concept of Human Biological Race

Charles Robert Darwin (1809-1882) was aware of the weakness of the concept of human race. In his book on the origin of humankind published in 1871 he argued for complete interfertility of races, and their physical and mental similarity. Races "graduate into each other" he said.[11] He also stated that sexual selection was the main force involved in originating races and that humankind is one species originated in Africa. The darwinian revolution eradicated the typological or static concept of species, but its impact on the concept of human race was less significant for a long time.

At the beginning of the century Franz Boas (1858-1942) was among the first anthropologists to struggle against biological determinism, which dealt with the cause and effect relationship between biological and cultural traits, and against the degenerative effects of racial crossing. Besides, in his book and paper published in 1912 the magnitude of short-term environmental effects on the variability of morphologic traits was well documented. This empirical observation produced his opposition to the stability of anthropometric features and therefore the opposition to the idea of race as fixed group (Boas 1928:63):

> We have seen that from a purely biological point of view the concept of race unity breaks down [...] similarities between neighbouring races [...] are so great that individuals cannot be assigned with certainty to one group or another.

More recent attempts were made to discredit the notion that human body proportions are primarily racial (M. Kapell and B. Bogin, personal communication).

Montagu who was the supporter of anthropology against nazi-fascist racism rejected the "anthropological" concept of race, while supporting the genetic subdivision of humankind (Montagu 1952). In our opinion, this was an incorrect approach, since genetics is a level of biological knowledge which can be compared with morphology or physiology but not with physical anthropology. Physical anthropology has failed by assuming the taxon of race to rank human biological variation

[11] Darwin, 1871, chapter 7.

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using both morphology and genetics, and more recently, it has also failed at the DNA level analysis. The cause of the evident failure was made clear by the Debate that took place in the field of Zoology during the 1950s in which the scientific inconsistency of race as a biological taxonomic concept (Wilson and Brown 1953; see also Futuyma 1979) and, consequently, its inconsistency when applied to humankind was argued. Nevertheless, Montagu was crucial in helping both physical and cultural anthropologists, as well as the non-anthropological community to understand the fallacy of the concept of race (Reynolds and Lieberman 1996).

The concept of race occupied a central position in physical anthropology up until the early 1960s when the last classification of races was published by Stanley Marion Garn (1961), and an active Debate took place between eminent specialists who defended or rejected race. In the Debate reported in collections of papers (Montagu 1964; Mead et al. 1968), and in scientific journals, mainly Current Anthropology, races were considered objective natural realities,[12] or absolutely unsuitable for describing human biological variation.[13] The failure of the concept of race as a useful tool in physical anthropology to understand biological variability was synthesised in a masterly manner by Frank Brown Livingstone (1962:279): "Variability does not conform to the discrete packages labelled races". However, it should be noted that the same notion of race evolved from typological to a populational and processual concept (Lieberman 1968; Count 1964).

In 1962 Carleton Stevenson Coon (1904-1981) related the concept of race to evolutionary synthesis. In his analysis culture was linked to biology so that each race was related to a different cultural level. Coon stated that races reached the evolutionary stage of *Homo sapiens* at different times, and considering that Europeans and Asians emerged before Africans, they were culturally more advanced being faced with civilisation for a longer period of time. His interpretation of the last phase of our biological evolution was generally criticised as a racist version of the multiregional hypothesis (see below).

Several scholars supporting the concept of race developed

[12] Czekanowski 1962; Dobzhansky 1962a, see also 1962b; Lasker 1962; Wiercinski 1962; Gates 1963; Newman 1963; Coon 1964; Garn 1964; Huxley 1964.

[13] Hiernaux 1962, 1963; Livingstone 1962, 1963; Montagu 1963; Brace 1964.

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research strategies which at last favoured scientific criticisms of the concept itself. Renato Biasutti (1878-1965)[14] in the four editions of his book (1941, 1953, 1959, and 1967; the last is reported in the bibliography) summarized morphologic and genetic trait variations in geographic distribution maps which showed lack of correlation between traits. This approach turned out to be so damaging for the concept of race because it contained the basis for a scientifically more valid appraisal of human biological variation, i.e. the use of the cline concept or the gradual transition (Livingstone 1962; Brace 1964; Cavalli-Sforza 1972; Beals 1982). Besides, during the 1960s many scientists were called to develop empirical studies on the role of selective and adaptive forces, and according to Charles Loring Brace (1964) these kind of studies would make possible abandoning the concept of race.

In 1972 Richard Charles Lewontin gave an empirical falsification of the concept of race (see next paragraph). Ten years later another Debate appeared in Current Anthropology (Littlefield et al. 1982) and in other journals (Nei and Roychoudhury 1982) between specialists defending or criticising race. The main opinions against race expressed during the 1970s were summarized by Eliene Sousa Azevêdo (1982:647): Human biological variability is continuously distributed; human biological classifications are arbitrary; and it is scientifically impossible to demonstrate the existence of races.

The racial paradigm lost consensus during the last decades of the century. Leonard Lieberman and Fatimah Linda Collier Jackson (1995) demonstrated that American anthropology textbooks which rejected the concept of race reached only twenty percent between the 1930s to the 1960s, and increased to seventy percent in the 1980s. But the controversy on race is not over yet. Indeed, the concept of race seems alive and prospering in the popular imagination, and among physical anthropologists (Goodman and Armelagos 1996). A survey carried out in the United States in 1985 clearly demonstrated that half of physical anthropologists agreed with the statement that races exist (Lieberman and Jackson 1995; see also Lieberman et al. 1992). And more recently, in 1993, the American Association of

[14] Biasutti subdivided humankind in 4 cycles, 4 branches, 16 stocks, and 53 living races.

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Physical Anthropologists rejected a statement against the scientific use of race (Armelagos 1995; Lieberman and Jackson 1995, note number 7). A year later, George John Armelagos (1995:104) reported:

> In 1994, the executive board and the section assembly of the American Anthropological Association passed a resolution stating, in part, «that differentiating species into biologically defined "races" has proven meaningless and unscientific as a way of explaining variation (whether of intelligence or other traits)».

Strangely enough this scientifically plain statement, which represented the current state of the art, did not appear in the revision of the 1964 UNESCO proposal named AAPA Statement on Biological Aspects of Race (1996). On the contrary the AAPA document included old, obvious, and confusing ideas on the concept of race unfit for a revision. Indeed, American anthropologists adopted a position against the existence of pure races (point 3); against the superiority or inferiority of biological races (point 6); against the restriction of intermarriages between individuals of different races (point 9); and against the possibility of identifying a national, religious, linguistic, cultural or economic group with a particular race (point 10). But all of these statements simply re-proposed the Debate of the first half of the century, so why were they offered as revisions? Probably such an obsolete document was imposed by so many physical anthropologists who believed that human biological races exist. This idea is reinforced by point 5 where the statement "humanity cannot be classified into discrete geographic categories with absolute boundaries" is followed by "the complexities of human history make it difficult to determine the position of certain groups in classifications". The second part is tautological but necessary to be able to mention human racial classifications. Indeed, it is absolutely impossible "to determine the position" of each population and not only "of certain groups", and this is why classifications are meaningless. We also think that the position against racism (point 11) is culturally correct and always useful, but we would like to point out that the problem with the biological concept of race is scientific in nature and not social: That is race is "unscientific as a way of explaining variation".

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The concept of race seems to have found new vitality in recent literature. In fact it is deeply involved in one of the main models concerning the origin of anatomically modern humankind (Lieberman and Jackson 1995, and note number 7), the "multiregional model" which proposes a scenario where different populations of *Homo ergaster* are simultaneously transformed into modern humankind in different parts of the world. The model suggests a great antiquity in the differentiation and evolution of races from the local types of *Homo ergaster* into their anatomically modern descendants (Weidenreich 1947; Wolpoff et al. 1984; Thorne and Wolpoff 1992; Wolpoff 1993; Frayer et al. 1993). However, the racial palaeontology concept was rejected by other scholars:

> The fallacy of tracing lines of descent for living populations backwards into the Pleistocene and evoking some grizzled fossil skull as an honoured ancestor is confined today to the claims of non-scientific champions of reburial politics [...] We must conclude that beyond the span of a few centuries all such lines become tenuous, and within a few millennia we literally lose the thread of morphometric associations thereby rendering affinities un-recognizable and untraceable" (Kennedy and Chiment 1992:122-123; see also Kennedy 1976).

Recently, one of the main supporters of the "multiregional model" and then of the racial concept, Alan Thorne, stated in his speech at the Dual Congress 1998 (Sun City, South Africa) that "races disappear, people continue in a new form". In our opinion there is an evident contradiction in Thorne's position, because his statement is obviously against the concept of race.

The concept of race is also currently used by forensic anthropologists. They claim that skeletal traits (cranial, post-cranial, and dental) would allow the identification of the race to which the bones of a corpse would belong, and to this purpose several anthropometric measurements and functions are used to yield a quantitative value from which "race is indicated by whether or not a specimen's score falls above or below a predetermined sectioning point value" (Sauer 1992:109). Also non-metric or anthroposcopic methods are used in race determination (Krogman and Iscan 1986:272[15]). According to

[15] "The more typically Negroid has undulating supraorbital ridges, sharp upper orbital margins, a rounded glabella, a plain frontonasal junction, and a wide

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forensic anthropologists race should be determinable from "white" and "black" skull morphology in eighty to ninety percent of cases; but only one out of seven for American Natives. The indefinite results should be "attributed to the incomplete nature of the remains or mixed ancestry" [Sauer 1992:109]. However, as forensic anthropologists know, Americans of African or European ancestry, for example, are blended populations from a variety of different areas in Europe and Western Africa. Besides, African-American communities are genetically mixed with American Natives and Europeans (Reed 1969; Crawford 1984; Biondi et al. 1988; Brues 1992; Hsieh and Sutton 1992; Bortolini et al. 1997; Bravi et al. 1997; Parra et al. 1998; Martinez-Labarga et al. 1999). The discrepancy of the concept of race in forensic anthropology was well proved by researchers involved in the discipline:

> My position in this paper is that race identification by forensic anthropologists *has little to do with whether or not biological races exist* (emphasis ours). The race controversy in anthropology is a Debate about natural groupings of human biological diversity, a question of taxonomy [...] Whether these [geographic populations or ethnic groups] are cultural, sociological or biological categories is irrelevant. Forensic anthropologists may be very good at matching a set of remains to the race label ascribed to a missing person, but the practice has little if anything to do with the taxonomic questions about the natural existence of races" (Sauer 1992:109-110).
>
> To the physical anthropologist, race is **simply** a phenomenon to be explained [...] race is the fact that geographically separated populations differ in their gene frequencies and range of phenotypic variation, which therefore may be used to estimate the probability that an individual's area of ancestry is more probably one place than another" (Brues 1992:125).

In our opinion, forensic anthropology seems a good example of inductive thinking: The generalization from the observed biological variability of humankind to the concept of race. But "generalizing from data to principles, is the

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interorbital distance [...] White skulls have mesa-like supraorbital ridges, blunt upper orbital margins, a depressed glabella, «beetling» of the frontonasal junction and a narrow interorbital distance".

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foundation of scholarship and most social science" (Harpending 1995:100) not of natural science. On the contrary, from the biological point of view the concept of race was falsified by comparing the prediction of the hypothesis to empirical observation. For anthropologists involved in forensic medicine the concept of race means everything and nothing: As a matter of fact, Sauer concluded his paper "let us not fall into the trap of accepting races as valid biologically discrete categories because we use them so often" [Sauer 1992:110].

A recent attempt in using the concept of race came from psychologists (Rushton 1995; see also Rushton and Bogaert 1989). They claimed a basic identity between the biological and social concept of race, and used a very high number of biological, psychological, and social traits to trace a model of racial differentiation in which Europeans appeared in an intermediate position between Africans and Asians (for a detailed discussion see Bogin 1993 and Armelagos 1995).

In the end, it could be said that if race is everything, it is able to explain nothing. It could seem that the concept of race is like the Phoenix or a chameleon, as Armelagos (1995) suggested, and scientific statements against race are needed over and over again. Recently Barry Bogin (1993) conclusively criticised race because of inter-fertility between groups. Cavalli-Sforza, Menozzi and Piazza (1994) also stated the scientific decline of the concept of race suggesting the importance of different lines of research, such as those involved in the reconstruction of micro-evolutionary history of human populations.

Dismantling the Concept of Human Biological Race

The first half of the twentieth century was characterized by an imposing development of genetic knowledge. In 1865 the laws of heredity were provided by the monk Brother Gregor, known in the world as Johann Mendel (1822-1884), and published in 1866, although they remained mostly unnoticed until 1900. They were rediscovered independently by Carl Correns (1864-1933), Erich von Tschermark (1871-1962), and Hugo de Vries (1848-1935), and were responsible for a new scientific discipline to which William Bateson (1861-1926) gave the name of Genetics in 1906. The flourishing of studies in the new field produced two events of extraordinary importance for their impact on the concept of race. The first event was the discovery of a new class of biological traits called genetic

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markers, which are strictly inherited and immune, in the short ran, to changes induced by the environment. The AB0 blood group was the first genetic marker discovered by Karl Landsteiner (1868-1943) in 1900, but its heredity was demonstrated only in 1911. The second event was due to Ronald Aylmer Fisher (1890-1962), John Burdon Sanderson Haldane (1892-1964), and Sewal Wright (1889-1988) and consisted in the rise of population genetics from 1930 to 1950, providing mathematical models and statistical tests to approach micro-evolutionary processes. The new discipline, founded by Fisher (1930), considered genes not only as hereditary factors which produce a single individual, but as hereditary factors common to a group of individuals, i.e. a population, and able to distribute and recombine between them. Population genetics used genetic markers to produce theoretical and empirical researches on evolutionary forces affecting populations: genetic drift, migration, mutation, natural and sexual selection; thus populations became the new units of evolution.[16] The genetic approach to the study of human biological variation did not escape for several decades to the racial paradigm, as it had already happened to morphology. At last it became scientifically clear that a static concept of race was not able to explain the dynamic processes of evolution. However, it was reported (Mukhopadhyay and Moses 1997:519) that "yet the rise of population genetics was not sufficient to eradicate the old racial worldview" among physical anthropologists, who simply transformed race typological concept into race populational concept. Ironically, during the development of population genetics, which set the grounds for the scientific falsification of the concept of race, biological racism increased and many political crimes were carried out in the name of racial purity and racial superiority, "totally unconnected with science" (Cavalli-Sforza et al. 1994:19).

The first time genetic markers were used in evaluating racial differences was before the advent of population genetics. At the end of the second decade of our century a biochemical index based on AB0 blood group alleles, the ratio of A to B allele

[16] Tabulations of allele frequencies from a number of populations with evolutionary purposes were given by Mourant (1954), Mourant et al. (1976), Steinberg and Cook (1981), Tills et al. (1983), Nei and Roychoudhury (1988), and Cavalli-Sforza et al. (1994).

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frequencies in populations was proposed (Hirszfeld and Hirszfeld 1918-1919). The index allowed to subdivide humankind into three racial groups: At the polar ends there were Europeans and Asians-Africans, and in the middle Arabs-Turks-Russians-Jews. Later efforts in defining racial classifications with an increased number of genetic markers were achieved by William Clouser Boyd [(1903-1983) 1950], and Garn (1961). We think it is of some interest to note that in the title of his book Boyd introduced the adjective modern to better define his genetic approach to the problem of human racial classification, and Brace stated in 1996 "Garn and others were simply reiterating what Samuel George Morton (1799-1851) had done in 1839".[17]

The development of mathematical techniques, as genetic distances and principal components analysis, were used in evaluating biological relationships between populations or ethnic groups to verify if they clustered into larger racial groups in a multidimensional space. Biological relationships turned out to be deeply inconsistent when genetic markers and morphological traits were used. The reconstruction of phylogenetic trees of human evolution based on genes, showed a higher affinity between Europeans-Africans and Asians-Australians, while phylogenetic trees based on anthropometric traits showed that Africans clustered together with Australians and Europeans with Asians (Cavalli-Sforza and Edwards 1963; Edwards and Cavalli-Sforza 1964). Genetic traits were also used in calculating time and patterns of divergence between races: 30,000 years ago Occidentals separated from Amerasians; 15,000 years ago Occidentals splitted in Europeans and Africans; and in

[17] Quoted in Mukhopadhyay and Moses 1997, note number 4. Bell (1974:540) reported: "In 1830 Morton began collecting human craniums and eventually owned over 1,000 specimens [...] He devised ingenious ways to measure and calculate the capacity of craniums and concluded that races are distinguished by their skulls as well as by color. His *Crania Americana* (1839), by its use of physical measurements, the classification and comparison of data, and its accurate drawings, was a landmark in anthropology. In an «Introductory Essay» of ninety-five pages Morton asserted that the American Indians are a separate race, not descendants of migrants from Asia. «We are left to the reasonable conclusion,» he continued, «that each Race was adapted from the beginning to its peculiar local destination. In other words, it is assumed, that the physical characteristics which distinguish the different Races, are independent of external causes». The work was hailed in the *American Journal of Science* as «the most extensive and valuable contribution to the natural history of man, which has yet appeared on the American continent»".

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an intermediate point in time Amerasians splitted in Americans and Orientals (Edmonson 1965). Besides, in a seminal work Menozzi, Piazza and Cavalli-Sforza (1987) showed that allele frequencies were overlapping with continuous distribution patterns, called clines, among populations (see also Cavalli-Sforza et al. 1994). Genetic boundaries, if any, are always weak and only mean less local admixture which is mostly due to certain geographic and cultural barriers (Sokal et al. 1988; Barbujani and Sokal 1990).

In the early 1970s the world of physical anthropology got acquainted with the empirical falsification of the concept of race. Indeed, it is impossible to divide humankind into biological races because genetic variation within populations is higher, about 85 percent, when compared with that distributed between populations (Lewontin 1972, 1974; Nei and Roychoudhury 1974). The question of race was solved at last (Keita and Kittles 1997), and an indisputable support came from molecular biology. Rebecca Luisa Cann, Mark Stoneking, and Allan Charles Wilson (1987) postulated the recent dispersal from Africa to Europe and Asia of anatomically modern *Homo sapiens*, and the displacement of the earlier inhabitants without much inter-breeding. This reconstruction was based on mtDNA. Subsequent studies on mtDNA, autosomal DNA and Y-chromosome supported this hypothesis (Vigilant et al. 1991; Hammer 1995; Tishkoff et al. 1996; Jorde et al. 1997; Krings et al. 1997; Jin et al. 1999; Kaessmann et al. 1999; Pritchard et al. 1999; Thomson et al. 2000; Underhill et al. 2000). Recently, Roy D'Andrade and Phillip Andrew Morin (1996:367) stated:

> Examination of the relation between lineages and the physically distinct geographic groups that are called «races» – Asians, Europeans, Melanesians, and various types of Africans – reveals an interesting phenomenon. Racial groups show little or no phylogenetic structure,

and Craig Venter, head of the Celera Genomics Corporation in Rockville, declared that the entire sequence of the human genome had proved that human races do not exist (Angier 2000).

In the last decades molecular anthropology has helped reject a seventeenth century concept of race that often organizes the sampling regime of many modern biologists, promoting a

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wider appreciation of the global distribution of human biological diversity. Nevertheless, we still find, in renown scientific journals and books (Chiarelli 1995a; Foley 1995; von Haeseler et al. 1995), the term "human race" that we consider loose terminology (every scientist knows that we should rather use the term "human species"), whatever it could be the rationale behind its use.

If races were a taxonomic category, they should allow us to reconstruct the phylogeny of human populations, i.e. ancestor-descendant relationships. As a matter of fact, the human biological concept of race has only permitted to us reconstruct the ecological history of humankind. It is hard to understand why a racial concept persists in modern biological anthropology in spite of multiple evidences that invalidated its scheme. We are however confident to be witnessing the demise of such a logical error.

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DEBATE ON RACE

The Reality of Race: Contra Biondi and Rickards

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The article examines the paper by Biondi and Rickards entitled "The Scientific Fallacy of the Human Biological Concept of Race," published in this issue, and presents evidence supporting the scientific utility of race as a conceptual scientific tool. He shows how modern genetic research is validating the findings of physical anthropologists as to the identification of racial groups and their varying degrees of kinship.

Key Words: Race, subspecies, breeding populations, taxonomy, genetic markers, human blood groups, human genome, population genetics, forensic anthropology.

In their article The Scientific Fallacy of the Biological Concept of Race, Biondi and Rickards are guilty of the same "logical error" they ascribe to scientists who study race: they condemn the latter for inductive thinking. They themselves do what they accuse others of doing: they start with an assumption, that "the human biological concept of race" is "a fallacy," and then search for evidence to prove that assumption.

Thus in their second paragraph they set up a straw man so that they can demolish it. "Why did so many physical anthropologists refuse to test the hypothesis of whether human biological variability could be neatly [our italics] subdivided according to the taxonomic sub-specific categories of race?" they ask. But which of the scientists they quote ever claimed that the living peoples of the world could be "neatly" divided into races?" None of the scholars who use the term "race" has ever claimed that. And having made such an absurd claim it is, of course, easy for Biondi and Rickards to assert that anyone who believes in the straw man they have erected is guilty of a "serious error in scientific logic." Their argument is made even more anachronistic by their admission, later in their text, that even Darwin, who referred constantly to "race," made it abundantly

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clear that "races graduate into each other."[2]

The Marxist Basis of the "Anti-Race" Campaign

And how do our two authors attempt to explain the survival of the race concept amongst more rigorous scientists in modern times? They fall back on Marxist explanations. As documented by many writers, including Zirkle (1959), Davis (1986), Pearson (1991), and Hunt (1999), Marxists and other far-Left opponents of the concept of race claim that race as an invention devised to justify the "enslavement" of the people of the Third World under the "capitalist-imperialism" of the historically Caucasoid nations of the West. Thus, as recently as April 2001, the Revolutionary Communist Progressive Labor Party, in its publication Challenge, of April 11, 2001, maintained that "...racism will only end when workers make communist revolution and take political power away from the racist and sexist rulers." Biondi and Rickards make it clear that they think along these lines by their several references linking race and fascism, and their suggestion that race has been invented to serve as a useful tool for capitalist-imperialists. To support their claim that race is a fiction rather than a biological fact they cite a vast league of Marxist-thinking and quasi-Marxist scholars who in the mid-twentieth century came to dominate the field of anthropology in the Western world. Franz Boas,[3] Margaret Mead, Ashley Montagu, Livingstone, Lewontin, Loring Brace, and Lieberman are frequently cited. Herskovitz (1959), himself an admirer of Boas, has documented Boas's far Left background and commitments, and also the enormous influence he had in training Marxists and quasi-Marxist disciples who were to re-mould American anthropology into a radical quasi-Marxist tradition for at least tow generations.

Conway Zirkle's Evolution, Marxian Biology and the Social Scene (1959) documented the influence of Marxist thought, operating through the disciples and fellow thinkers of Franz Boas, and observed that:

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[2] Darwin, The Descent of Man, 1871.

[3] Franz Boas's students and disciples included Margaret Mead, Ruth Benedict, Frank B. Livingstone, C. Loring Brace, Otto Klineberg and Ashley Montagu. The powerful influence on American anthropology as a result of his becoming chairman of the first American department of anthropology to award doctoral degrees specifically in anthropology has been documented by Herkovits (1953).

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> The co-existence of our rapidly expanding sciences with stupid quack substitutes for science should surprise no one ...Marxian biology – exists also in non-Communist countries – in countries where it is not protected by Marxian dictators.

For any true appreciation of the political background of such authors, in addition to Zirkle, one has only to read Margaret Mead and Samoa (1983) by Freedman,[4] Far Left of Center (1988) by Kleber, Race, Intelligence and Bias in Academe (1991) and Heredity and Humanity (1996) by Pearson, or even The Evolution of Racism (1994), by Shipman, which distinguishes between racism and race. Shipman, while criticizing racism, exposes the taste for dissimulation common amongst those who sought to disparage the use of the term race in science, as in the case of Ashley Montagu, who she says was born Israel Ehrenberg in London's East End, but later chose for himself "the grand-sounding Montague Francis Ashley-Montagu, a choice that, by virtue of its hyphenation, had an upper-class ring to it [and] linked him with Lord Montagu of Beaulieu." Later, after he migrated to America, she recounts, he found it convenient to drop the two middle names to be known simply as Ashley Montagu, more in accordance with American tastes.

The UNESCO Statement on Race

It was this same "Montagu" who authored Man's Most Dangerous Myth: The fallacy of Race (1942), which must read like a bible to Biondi and Rickards. He was also largely responsible for the initial UNESCO Statement on Race which at the time was widely known as The Ashley Montagu Statement, but had to be drastically rewritten in later years by a more representative panel of scientists headed by the renowned French scholar Henri Vallois[5] The revised statement published in Man in June 1951, asserted that when groups possessed "well-developed and primarily heritable physical differences from other groups, they might be termed races."

Biondi and Rickards make much of the discredited Montagu-edited UNESCO statement on race, which was plainly

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[4] Freedman's publication exposed Margaret Mead's duplicity in promoting "free love" in Western society by falsely asserting that Samoan society was free from psychological stress because it encouraged random sexual relationships.

[5] Henri Vallois served on the editorial board of *The Mankind Quarterly* until for many years until his death in 1952.

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politically-motivated, but nothing of the revised 1952 statement. They admit their disappointment that a further statement by UNESCO in 1964 avoided stating that "differentiating species into biologically-defined 'races' has proved meaningless," and they further lament that a more recent American Association of Physical Anthropology (AAPA) statement dated 1996[6] still contained what they regarded as "old, obvious, and confusing ideas on the concept of race."

The AAPA statement did protest "against the superiority or inferiority of biological races," because only that would require a consensus as to what was meant by "superiority." The evidence of racial differences is clear – races differ in average intelligence, in forms of physical prowess, in resistance to and susceptibility to specific diseases, even in fertility. But who is to determine by which of these qualities scientists should agree to measure "superiority" or "inferiority"? Some races excel in some qualities, others may excel in other qualities. Possibly the only yardstick by which one could measure superiority is by an ongoing phylogenetic ability to meet the Darwinian challenge to survive. Intellectual ability and physical fitness are obviously important, but resistance to disease and high rates of fertility are likewise essential qualities.

The Bible and Race

Biondi and Rickards seek to imply that because humankind has from very early times recognized the existence of races and attempted to explain their origin by imaginative fables (such as descent from the three sons of Adam) the idea of race is itself false. But such ancient myths and allegories merely confirm that from early times the reality of race was readily apparent, and the fact that early men attempted to explain it by mythical allegories in no way proves that race does not exist – quite the contrary.

Indeed, they seem to draw great satisfaction from stressing the absurdity of Biblical explanations of race, and they revert to this subject several times. It is true that the influence of Christianity suppressed the intellectual achievements of the more logical Greek and Roman civilizations for centuries, until the Renaissance enabled Europe to at least partially free itself from primitive superstition and the Levantine religious tradition

[6] AAPA. 1996. AAPA "Statement on Biological Aspects of Race," *American Journal of Physical Anthropology* 101:569-570.

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of supine submission to an all-powerful monotheistic deity. Free enquiry into the scientific concept of race owed its inspiration to ancient Greek logic, not to the miasma of religious beliefs that came into Europe from the Middle East. Darwin would surely confirm the viciousness of the attacks made against his theory of evolution because it challenged the Christian belief in miraculous creation, and the brotherhood of all peoples and all races as children of "God, the Father."

While it is true that some of the eighteenth and nineteenth century European investigators into the physiology of race did tend to concentrate overmuch on the shape of the skull, there was good reason for this. In the course of hominid evolution, our forebears first came to resemble modern humans from the waist downwards as they learned to walk upright. By the time of *Homo erectus* our forebears had become "modern" up to the neck, but it was in the last stages of evolution at the level of *Homo sapiens* that the cranium assumed its present variety of forms. Blumenbach, cited by Biondi and Rickards, was wrong to theorize that minor differences in the shape of the cranium reflected the regions where the brain was most developed, but at his time this seemed to be a reasonable hypothesis worthy of investigation. In the course of evolution, brain size and cranium size increased as intelligence increased, and low-browed Neanderthals were most probably less intelligent than high-browed Cro-Magnons. The errors of early investigators do not invalidate the validity of subsequent scientific concepts.

The Attack on Carleton Coon

Carleton Coon (1962) and R.R. Garn (1963), whom the authors identify as the author of "racist" theories of human evolution, fully realized that among human beings, races generally merged into one another, and that the human population of the world could not be "neatly" divided into totally distinctive racial categories. One of his major contributions to the subject was precisely in the field of what he called "genetic clines," gradually changing frequencies in the distribution of genes in intermediate populations located in between the epicenters of racially divergent populations.

The views of politically-committed authors Lewontin and Livingstone are cited as evidence against both Coon and the eminent Italian anthropologist, Renato Biasutti (1967), before Biondi and Rickards proceed to lament the fact that "the

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concept of race seems alive and prospering in the popular imagination and among physical anthropologists." The latter express concern that a survey carried out in 1985 "clearly demonstrated that half of physical anthropologists agreed with the statement that races exist," and especially that in 1993 the American Association of Physical Anthropologists rejected a statement against the scientific use of race." In all that they write there is little evidence to justify their decision to entitle their article "The Scientific Fallacy of the Human Biological Concept of Race."

Genetic Markers and Race

As early as 1950, W.C. Boyd published a seminal study entitled Genetics and the Races of Man: An Introduction to Modern Physical Anthropology,[7] since which their has been a constant flood of studies investigating first the distribution of blood groups around the world and more recently the analysis of DNA, mtDNA and other genetic markers. R. Ruggles Gates (1963) published his important study, Racial Genetics, opening the door to the examination of the genetic basis of race: race is a biological concept, and as man's understanding of genetics expanded, Gates saw clearly that race was to be identified on a genetic basis rather than by cultural elements.

Following Boyd, and Gates, an examination of the prime biological indicators of race was offered by E. Sunderland in 1975, in an article entitled, "Biological Components of the Races of Man." This appeared in Racial Variation in Man, edited by J.F. Ebling and published by the London-based Institute of Biology. Aware that frequencies of genetic characteristics varied from population to population, in 1952, T. Bielicki published his paper "Some possibilities for estimating inter-population relationship on the basis of continuous traits,"[8] and since then almost unbelievable progress has been made in the investigation of human DNA and more recently mtDNA, all of which serves to more clearly reveal the ancestry of every unique individual, and his or her degree of kinship to other individuals, breeding populations and races.

Because DNA can often be extracted from even ancient remains, mtDNA extracted from a 9,000 year-old skeleton in

[7] W.C. Boyd, 1950, Boston: Little Brown and Co.
[8] *Current Anthropology*, 3: 3-8.

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Cheddar, England, was matched with that of living people in the same locality, and it was found that one man, living just a short distance from the site of the fossil artifacts, was a descended from the subject. If an objection from local Indians had not prevented genetic tests on the remains of Kennewick man, it would have been possible to confirm without reasonable doubt the race of the Caucasoid-like but incomplete skeletal remains of this remarkable discovery. Geneticists can even assess the likelihood that an individual was a redhead simply by testing for mutations in the gene for the receptor for the hormone that spurs production of the pigment melanin. (Watson, A., 2000, p.854).

While race can generally be determined from an examination of the skeletal remains, except in the case of the most hybrid individuals, today it can invariably be inferred from the frequencies of alternative forms or alleles of genes because allele patterns are inherited and differ according to racial origin. All geneticists, whether or not they choose to speak of "races" or simply of "populations," are quite aware of the fact that not only do the ratios of different alleles vary from race to race, but also there are a number of race-specific genetic markers. Hybrid populations present difficulties, but these are not unsurmountable, as C.L. Hsieh and H.E. Sutton revealed in their 1992 study "Mitochondrial and Nuclear Variants in a U.S. Black Population: Origins of a Hybrid Population," published in Annals of Human Genetics.[9]

Indeed, a few rare alleles are to be found only in specific populations or race-groups. Thus, as A.E. Mourant[10] discovered as early as 1954 (pp 138-139), there are some blood groups that are unique to certain micro-races, and some blood groups that are completely absent from others (Brazilian Indians are unique in completely lacking the Duffy antigen). Genetic markers even vary when one crosses linguistic boundaries as shown by R.R. Sokal, N.L. Oden, and B.A. Thompson[11] in their paper entitled

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[9] C.L. Hsiah and H.E. Sutton, *Annals of Human Genetics*, 56: 105-112.

[10] Mourant, A.E., 1954, *The Distribution of Human Blood Groups*. Springfield: Charles C. Thomas. See also the later publication: Mourant, A.E., A.C. Kopec, and K. Domaniewska-Sobczak. 1976. *The Distribution of the Human Blood Groups and Other Polymorphisms*. London: Oxford University Press.

[11] Sokal, R.R., N.L. Oden, and B.A. Thompson (1988) *American Journal of Physical Anthropology* 76:337-361. See also G. Barbujani and R.R. Sokal, 1990, "Zones of Sharp Genetic Change in Europe are also Linguistic Boundaries," Proceedings

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"Genetic Changes Across Language Boundaries in Europe." Because linguistic boundaries tend also to divide breeding populations and so foster and sustain mini-races or subraces. The close link between language and ethnicity in earlier times was so marked that the mid-nineteenth century British anthropologists even suggested that nations as separate breeding populations could be viewed as incipient microraces.[12]

Forensic Anthropology

Indeed, one wonders Biondi and Rickards trouble to mount an attack on forensic anthropology. It is a well-established fact that forensic anthropologists can determine with a high degree of accuracy whether a skeleton is that of an African, a Caucasoid or a Mongoloid, often with only incomplete skeletal evidence. Yet they condemn forensic anthropology as "a good example of inductive thinking: The generalization from the observed biological variability of humankind to the concept of race." But what is wrong with that? How does science proceed without hypotheses and classification. When a classificatory system has been proposed is tested and proved consistently useful, it is surely a useful scientific tool.

Forensic anthropology, using a wide range of anthropological and now genetic techniques, has proven itself as a reliable discipline. Often the remains of a victim are incomplete, but even if only parts of the skeleton survive, investigators have been able to identify individuals by comparing genetic evidence extracted from the remaining bones, and comparing that with DNA obtained from close relatives. And race is kinship.[13] The race of deceased individuals can usually be determined from even the most minute remaining body parts.

One of the best recent surveys of the biological markers by which forensic anthropologists are able to identify race is the article "Forensic Diagnosis of Race – General Race vs. Specific Populations" by A. M. Brues (1992). But perhaps the most dramatic response to the claims of Biondi and Rickards lies in N. J. Sauer's 1992 article published in Social Science and Medicine under the title, "Forensic Anthropology and the Concept of

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of the National Academy of Sciences (USA) 87 (5): 1816-1819.

[12] Sir Arthur Keith, 1940, *A New Theory of Human Evolution*, London: Watts & Co.

[13] See Hughes, A.L. 1988. *Evolution and Human Kinship*. New York: Oxford University Press

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Race: If races don't exist, why are forensic anthropologists so good at identifying them?"[14]

Cavalli-Sforza and Venter

Perhaps Biondi and Rickards' most dangerously misleading arguments are to be found under the heading "Dismantling the concept of human biological race." This choice of title seems to reflect the entire intention of their article. Thus they cite a statement denying race made by Craig Venter of Celera Genomics, and similar comments by Cavalli-Sforza[15], both of whom are renowned for their pioneering work in research into the human genome. The work of Cavalli-Sforza has been discussed by the late Glayde Whitney, himself a geneticist and neuroscientist, in an earlier issue of this journal in an article entitled "Races do Not Exist, So Study Them." What Whitney says of Cavalli-Sforza would also apply equally well to Craig Venter:

> It has been suggested repeatedly that the denial of race is a strategic ploy to allow him to proceed with his favorite research. There may be some truth in this, in that it is well documented that he has had troubles both from funding agencies and from spokespersons for "indigenous peoples" whose genetics he wished to sample (Kahn, 1994). I know from personal experience that many world class researchers in human genetics are running scared of the anti-racial thought police. When I mentioned race differences in a presidential address to the Behavioral Genetics Association, some of my colleagues urged me to resign for the good of science – by bringing up race they feared that I had placed funding for behavior genetic research in jeopardy. In a similar vein, a widely used current textbook of behavior genetics claims that Jensen's 1969 writing about race and intelligence had constituted a grave threat to the entire field of investigation (Plomin et al, 1997). So, LL.C-S can remain one of the angels, have access to native groups, and be funded, by denying that races exist – he studies genetics of

[14] *Social Science and Medicine* 34:107-111.

[15] Cavalli-Sforza and colleagues have accomplished remarkable and essential work in their various publications, most notable of which is their 1994 publication, *The History and Geography of Human Genes*, and although they studiously attempt to avoid referring to races, their findings validate the traditional race groupings identified by skeletal data.

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populations, not races.[16]

When one realizes that Craig Venter's entrepreneurial Celera Genomics raises income from selling subscriptions to its products at prices in the region of $10 million per year, one can certainly see how it must keep a squeaky clean political image if it is to survive financially.[17] Meanwhile, Cavalli-Sforza himself describes and compares different populations, sometimes using traditional race terms such as "Caucasoids" and "Northern Mongoloids," but at others resorting to purely geographical terms that are thinly veiled substitutes for established racial and ethnic designations. Thus he constantly makes statements like the following:

> ...the greatest difference within the human species is between Africans and non-Africans. ...The cluster formed by Caucasoids, northern Mongoloids, and Amerinds is reasonably compact in all analyses. (1994, p.8)

Indeed, in the case of Craig Venter it is necessary to point out that his company is selling access to a data base of 2.8 million unique SNPs (unique forms of genes) obtained from individuals specifically chosen as representative of different races.

But there is a simple explanation as to how scholars such as Cavalli-Sforza and Craig Venter can protect their research findings – they have only to make statements that seem to support the "anti-race" mantra claim that race is a cultural and not a biological phenomenon, and resorting to an alternative terminology which preserves their scientific self-respect. The term "race" can be used in a multitude of different ways, and as Whitney points out, Cavalli-Sforza confounds the scientific concept of race with "racism" as a social phenomenon, when he defines racism as "the belief that one race is biologically superior to all others." Using this as his definition of race, Cavalli-Sforza is thus justifiably able to declare that "It seems to me wise, therefore, to abandon any attempt at racial classification along traditional lines."[18]

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[16] Glayde Whitney, "Races do not Exist – So Study Them," *Mankind Quarterly*, Fall 2000, Vol. XL!, No. 1.

[17] Cf. Glayde Whitney, "The Emperor's New Clothes: Biological Theories of Race at the Millennium," *Occidental Quarterly*, Volume 1 Number 2, Winter 2001

[18] L.L.P. Cavalli-Sforza, P. Menozzi and A. Piazza, *The History and Geography of*

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Cavalli-Sforza is still obliged in his numerous comparisons of human populations to identify population groups which correspond precisely to historically identified racial groups. Choosing to avoid their traditional names as far as possible he resorts to a much less precise terminology based primarily on geographical location. This has been well documented by Edward M. Miller in his review of the monumental History and Geography of Human Genes.[19]

There is yet another important fact. Most of the genes scrutinized in Cavalli-Sforza's project are not necessarily those that are of significance to racial variation. Thus, if we note the fact that the ABO blood system is shared by virtually all mammals, e.g. by both humans and cattle, we could easily stretch a point and say that our findings in respect of the ABO system do not allow us to say that there is any significant racial difference between bovine mammals and human mammals. Indeed, it has been estimated that humans and chimps share 98.56 percent of their genes, and that would mean that a difference of 1.44 percent is very significant. That being the case, the claim that blacks and Caucasoids share 99.84% would seem to indicate significant hereditary or racial differences rather than the reverse, and to provide substantial justification for considering race to be a valid subject for further scientific examination.

And Current Anthropological Views

Along with the recognition of the significance of group differences has come a realization of the fact that human nature is shaped by biological, and to a large extent genetic forces. This makes the study of group or racial differences of potentially immense social significance. In 1969, eminent Berkeley psychologist Arthur R. Jensen came under fire after the *Harvard Educational Review* published his epic nearly book length article "How much can we boost IQ and Scholastic Achievement,"[20] which with his later Educability and Group Differences[21]

Human Genes, p.29,. 1994, Princeton University Press, Princeton, N.J.

[19] E.M. Miller, Tracing the genetic history of modern man: a review," *Mankind Quarterly*, Winter 1994, XXXV No 35, pp 71-106.

[20] *Harvard Educational Review*, February 1969. Jensen has since followed this with a barrage of research publications, culminating with his epic book, *The g Factor: The Science of Mental Ability*, 1998, Westport CT: Praeger.

[21] Jensen, A.R. 1973. *Educability and Group Differences*, London: Methuen.

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demonstrated that intelligence was largely inherited and varied between races as well as within races.

In 1971, the iconoclastic London psychologist Hans Eysenck's Race, Intelligence and Education,[22] and in 1991, Richard Lynn analyzed "The Evolution of Racial Differences in Intelligence,"[23] to be followed by other more detailed publications including his 2001 book, IQ and the Wealth of Nations.[24] Also in 1991, T.H. Goldsmith published The Biological Roots of Human Behavior: Forging Links between Evolution and Behavior.[25] More recently, in 1991 C.N. Degler published In Search of Human Nature: The Decline and Revival of Darwinism in American Social Thought,[26] and J. Philippe Rushton wrote even more explicitly of racial behavioral differences in Race, Evolution and Behavior (1991). Since then, S.J. Taylor has highlighted the social implication of race differences and the need for social policies to take note of the role of heredity in human affairs in his Paved with Good Intentions (1992),[27] and has brought widespread attention to racial differences in behavioral potential.

With all this happening, Biondi and Rickards express concern that "a survey carried out in 1985 clearly demonstrated that half of physical anthropologists agreed with the statement that races exist" and that "more recently, in 1993, the American Association of Physical Anthropologists rejected a statement against the scientific use of race." But determined not to be discouraged in their crusade, they doggedly persevere in maintaining that race is merely a social invention, and has no basis in biology, and that because "the concept of race seems to have found new vitality in recent literature," they conclude that "scientific statements against race are needed over and over again." They cite the achievements of the respected forensic anthropologist A.M. Brues to illustrate what they regard as the extent of the revival of race as a legitimate field of study by modern scientists, but they do not even attempt to refute his statement that:

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[22] H. Eysenck, 1971, London: Temple Smith
[23] *The Mankind Quarterly*, Vol. XXXII No. 1, Fall, 1991,
[24] R. Lynn, Praeger.
[25] T.H. Goldsmith, 1991, New York: Oxford University Press.
[26] C.N. Degler, 1991, New York: Oxford University Press,
[27] S.J. Taylor, 1992, New York: Carroll and Graf .

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> To the physical anthropologist, race is simply a phenomenon to be explained ....race is the fact that geographically separated populations differ in their gene frequencies and range of phenotypic variation, which therefore may be used to estimate the probability that an individual's area of ancestry is more probably one place than another" (Brues, 1992:125).

The significance of racial differences between the races of man are thrown into relief when we consider the relative minor differences that distinguish chimpanzees and other primates from *Homo sapiens.*[28]

Yet Biondi and Rickards claim in their concluding paragraph that:

> If races were a taxonomic category, they should allow us to reconstruct the phylogeny of human populations, i.e. ancestor-descendant relationships. As a matter of fact, the human biological concept of race has only permitted us to reconstruct the ecological history of humankind.

But that is exactly what the students of race have been and are doing – throwing light on the evolutionary history of our species. Prominent amongst present-day researchers engaged in this work are M. Nei and A. K. Roychoudhury (1993). Studying the distribution of 121 alleles of 29 genes among 26 sample populations, and fifteen contemporary human populations in respect of 33 variable genes, they confirm that a major division took place early in the evolution of modern men between Africans on the one hand and Europeans and virtually all other races. A subsequent division separated Europeans, or Caucasoids, from Mongoloids. Other major separations occurred when Asians crossed over into the Americas to become the ancestors of the American Indians, which further racial divisions marked off the inhabitants of the Pacific Islands from the Asian mainland. Similarly, the Australoids and Papuans are also genetically very different from the inhabitants of Asia.[29]

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[28] See, for example, R. Dandrade and P.A. Morin, 1996, "Chimpanzee and Human Mitochondrial DNA." *American Anthropologist*, 98: 352-370.

[29] See M. Nei,and A.K. Roychoudhury, 1993 "Evolutionary relationships of human populations on a global scale." *Molecular & Biological Evolution*, 10. Also, "Genetic Relationships of Europeans, Asians and Africans and the origins of modern *Homo sapiens*," *Human Heredity*, 39: 276-281.

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Race and Medicine

Because of the many essential genetic differences between races that affect medical treatment, David Goldstein, a population geneticist at University College, London, recently suggested that patients be assigned to different genetic groups by analyzing their DNA, a procedure which would produce similar results to race classification but would obviate the need to use race labels or conduct research into the medical aspects of race as such. This incited Neil Risch of Stanford University to stress the significance of racial differences in medical treatment in an article in the online journal *Genome Biology*, causing even his critics to concede the truth of this contention.[30]

Risch explains that any time prior to the distinctive evolution of the living races of man, the ancestral human population would have contained many alternative gene forms inherited from the predecessor species. This shared pool of differences probably still accounts for the random genetic differences, around 85 percent to 90 percent of the total genetic differences, in today's global human population. The remaining 10 to 15 percent of human genetic differences are racial. In the face of this challenge, Goldstein said that he agreed with Risch that "the geographic patterning of genetic variation is real and has medical implications and one does need to take account of it ...Neil is arguing against some people in the medical community who say racial labels have nothing to do with drug response, and he is right,".

Similarly, Stephen O'Brien, a geneticist at the National Cancer Institute, is reported as having said that the conclusion that race was not a valid concept "comes from honest and brilliant people who are not population geneticists ...that doesn't mean they are insincere ...It's just that they haven't really looked at it."

Bette Phimister, editor of *Nature Genetics*, a journal which had favored avoiding race terms, apparently agreed, saying that "Risch's point that there is a high and useful degree of correlation between ethnicity/race and genetic structure, well taken, and one with which we agree." We are loathe to doubt Biondi and Rickards' sincerity (although we *do* doubt the

[30] An account of Neil Risch's paper and the favorable response it received from his opponents, can be found in "Race Is Seen as Real Guide to Track Roots of Disease" by Nicholas Wade, *New York Times*, July 30, 2002.

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sincerity of many Marxist and quasi-Marxists who write on this issue), and must assume that their position may likewise be due to the possibility that due to fear of racism "they haven't really looked at reality."

Contrary to what Biondi and Rickards contend, race by whatever name it is identified remains the underlying classificatory key to any understanding of the phylogenetic history of human genetic variability and the evolutionary history of *Homo sapiens* as a species. But Biondi and Rickards have nevertheless done their readers a service in illustrating the distorted logic and laborious misconceptions which lie not behind the concept of race, but behind the thinking of those who divert attention away from race, either from reasons of political ideology, from fear or condemnation, or else, perhaps, because "they haven't really looked at it."

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Reply to Biondi and Rickards

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The author examines the article by Biondi and Rickards entitled "The Fallacy of Race," finds this to reflect the classical Marxist view of race, and cites literature which in his opinion substantiates the reality of race.

Key Words: Race, Marxism, Franz Boas, Loring Brace, S. Gould, M.R. Lefkovicz, Stephen Rose, J.I. Graves, L.S. Gottfredson, J.P. Rushton, A. Jensen. R. Lynn. D. D'Souza.

In their paper published in this issue of *The Mankind Quarterly*, Biondi and Rickards predict the demise of the concept of race in human biology. Yet somewhat confusingly they compare this concept to the Phoenix and concede that it is thriving in forensic science, palaeontology and psychology (they fail to mention physiology). They also acknowledge that there is no consensus that this hypothesis is fallacious either amongst physical anthropologists or scientists generally. Indeed, whereas some researchers regard race as a purely social and political construction, others believe that it has "explanatory power" and "predictive and construct validity" (Rushton 1995).

As Biondi and Rickards observe, Darwin (1871) discussed the problems in identifying human races, leading to differences in the number of sub-divisions used and to different definitions. Yet despite these difficulties, Darwin still posited "an evolution-based racial hierarchy" (Simonton 1999). He regarded the ancient Greeks as the most intellectually gifted people that have ever existed. Moreover Darwin (1859) discussed the difficulties associated with the theory of evolution. Should that theory therefore be abandoned?

Race, racism and social oppression are systematically conflated in this paper. The text is embellished with colourful references to the curse on Ham, to the methodological errors of an obscure craniometrist (Bean) and to the derogatory assertions about Africans of an Italian anthropologist (Cipriani) prior to the Italian annexation of Ethiopia. The "troubles for the

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African populations began very early", the authors pointedly remark. Gould's attempt to associate recent research into group differences in IQ with the American Immigration Act of 1924 and the Holocaust comes immediately to mind (Gould 1981).

Gould dismisses the "myth" that a scientist can be objective. Like Althusser (1971) he views science as an integral part of the superstructure that maintains society. Lewontin claims that the main bulwark of the class system was formerly religion but is now social science (Lewontin 1991). The latter is regarded by these various exponents of the sociology of knowledge as little more than a factory producing rationalisations of socio-economic inequalities.

Viewed from this perspective, race is "a social, not a biological, construct", as Graves (2001) puts it. Although he concedes that the ancients recognised human physical differences, Graves considers the notion of a racial hierarchy a relatively modern European idea intimately connected with the colonization of the New World and the importation of slaves from Africa. Europeans subjugated the Negroes and the American Indians. Then they attributed their degraded status in society to natural inferiority. For Biondi and Rickards, likewise, theories of the "superiority of some races over others" were an expedient social invention, a "moral justification for immoral behaviours" when "western societies justified slavery, colonialism and discrimination". Note however that Graves is not a historian but a laboratory geneticist who identifies himself as an "African-American intellectual" (Brace 2001). And his suggestion that ranking people is a uniquely European phenomenon is reminiscent of the dogmas of Afrocentric Ancient "History" (Cleopatra was black etc), as documented by Lefkowitz (1996).

Like Graves, Biondi and Rickards emphasise the key role of "ideological conditioning" in the elaboration and diffusion of racial science. However, the latter can be viewed instead as an attempt to understand the puzzling civilisation gap between peoples. According to D'Souza (1995) the existence of this gap explains why the greatest thinkers of the Enlightenment, including Hegel, Hume, Lord Kames, Kant, Montesquieu and Voltaire, entertained views that would now be called racist. And so subsequently did Agassiz, Darwin, Galton, Huxley and Spencer. Yet according to Biondi and Rickards, these luminaries were all blind to scientific truth and automatically influenced by

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their class affiliations.

Nor do they explain how Boas and his epigones, who disputed key elements of the science of race, were unaffected by this supposedly remorseless process of "ideological conditioning". If racism creates "a special kind of blindness", as Lawler (1978) asserts, it seems to be a blindness to which only Marxists are immune.

The nineteenth century craniometrists, notably Broca and Morton, had an *a priori* commitment to ranking, according to Gould (1981). Biondi and Rickards, similarly, complain that anthropologists consistently failed "to test the [race] hypothesis". And C. Loring Brace, a disciple of Boas, detects in Jensen's research, "unexamined underlying assumptions", notably the "racialist assumption" that "entities called races exist" (Brace 2000, 2001). However, *apropos* modern differential psychology there is compelling personal testimony that contradicts this theory of the systematic "ideological conditioning" of the scientific community. Consider Eysenck. In the 1940's and 1950's, he thought that there was no evidence for genetic differences between racial groups (Lynn 1997). He changed his mind after reading A. Shuey's *The Testing of Negro Intelligence*, a compilation of numerous studies of the intelligence of blacks and whites that consistently indicated a 15 point black IQ deficit. Jensen, likewise, initially believed that standard IQ tests were culturally biased against ethnic minorities (1998a). In the early 1960's, he regarded the inheritance of intelligence an "outmoded and scientifically discredited" explanation of group differences in scholastic performance. It was his exhaustive study of the behaviour-genetics of intelligence that led him to conclude that the "exclusively cultural-environment explanations for racial differences in IQ were inconsistent and inadequate":

For if the white-black difference in IQ is entirely due to black social disadvantage, why do highly advantaged blacks on average perform no better academically than disadvantaged whites (Gottfredson 2000)? Why does the mean IQ difference between white and black children *increase* at each higher level of parental socio-economic status (Jensen 1998b)? And if differences in educational performance are completely attributable to environmental factors and if intelligence is learned, why have compensatory education programmes failed

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to reduce the W-B IQ difference (Jensen 1969, 1991)?

Finally, Rushton (1995) confides that he too originally believed that race differences in intelligence were "primarily environmental in origin". But that he was subsequently convinced "by data, and findings in numerous sources" that such differences "existed in deep structure". Ironically, these belated conversions evoke Biondi and Rickards' idealised vision of the scientist trying "to understand the phenomena of nature through the formulation of hypotheses and their subsequent empirical control by comparing predictions and observations".

In 1912, Boas posited "short-term environmental effects on the variability of morphologic traits", specifically, differences in cranial index between immigrants to the US and their American-born children. And in 1909, Franklin Paine Mall contended, *contra* Bean, "that there were no differences in human brains according to race". Biondi and Rickards conclude, on the basis of this superannuated evidence provided by Gould (1981), that anthropology failed "to rank human biological variation using morphology". However, as Malik (2000) has argued, there is a widespread attempt "to ignore science or censor data", when it comes to natural difference. Who would think from reading this paper that there is a "large empirical documentation" on group differences in brain size and on the correlation between cranial capacity and IQ (Murray 1996)? For the authors, like Gould before them, studiously ignore this modern literature.

They also fail to address other recent evidence that challenges the environmental and cultural explanations of the black IQ deficit. Amongst the more compelling items are W-B differences in reaction times when performing elementary cognitive tasks, the correlation between black IQ scores and black educational attainment, and the failure of trans racial adoption to produce significant long-term IQ gains (Jensen 1991, 1998b). In addition, psychometric *g* is correlated with numerous physical variables, including brain size, brain glucose metabolism and evoked brain potentials. And *g* is the main source of the W-B difference in IQ (Jensen 1998b, 2000). Slavery is often adduced as the cause of the racial gap in scholastic performance in the US. But a recent study (Rushton & Skuy 2000) showed that blacks in South Africa have lower average IQ than Afro-Americans. Note that the African-American

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population has on average approximately 25% of genes from populations of European descent (Jensen 1998b). Moreover, since the 1980's, Lynn has studied race differences from a worldwide perspective. He claims that there are consistent differences in IQ in a variety of geographic locations between the three broadest population groups (Lynn 1997).

The authors maintain that the racial hypothesis should be rejected not because of its "misuse for political reasons" but because it is "scientifically misleading". But this argument is disingenuous. For throughout their paper, this hypothesis is depicted as the central dogma of a pseudo-science that justified social oppression. Indeed, the claim that the racial paradigm is scientifically discredited is invariably based on the "egalitarian fiction" that there are no racial disparities in mental ability (Gottfredson 2000). Steven Rose is another scientist who regards race as "biologically meaningless" (Rose 2002). A convinced Marxist, Professor Rose is highly critical of all forms of "genetic determinism", notably socio-biology and evolutionary psychology (Brown 2001, Pearson 1993). Like Graves, he regards racism as a cunning strategy to divide the oppressed classes. Witness his interpretation of Jensen's 1969 monograph "How much can we boost IQ and scholastic achievement?" At a time of "fierce cultural and political struggle", he remarks, when "US racism" was under attack from the civil rights movement, science provided a timely demonstration of "white superiority in intelligence over blacks". Predictably, the awkward fact that Jensen *supported* the desegregation of education was omitted from this fanciful account.

Kohn (1996) wonders what would happen if scientists unanimously accepted the existence of innate group differences in mental ability. Would some people then reject science? Judged by this paper, there is little doubt as to the answer.

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DEBATE ON RACE

Race Unreal?

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Key Words: Race, geographical races, race prejudice, racial classification, classificatory systems.

Despite its length and abundant references, Biondi and Rickards 2002 present scarcely any argument against the race concept. Their survey of the history of this concept is not germane to its validity, and while the pronouncements cited of contemporary scientists and scientific organizations would normally carry great weight, in this case public disparagement of race may not express private judgment. Denial of race supports current atacks on race prejudice in the strongest way possible, by affirming that bigots literally are talking nonsense. Hoping to do good, scientists may be as ready to say what is deemed wholesome as what they think is true.

In fact, Biondi and Rickards rely on a single datum to invalidate race, the genetic continuity of all human populations. They repeat this point numerous times: "Races 'graduate into each other' [Darwin] said," "'[S]imilarities between neighboring races are so great that individuals cannot be assigned with certainty to one group or another' [citing Boas]," "The use of the cline concept or the gradual transition. . . turned out to be so damaging for the concept of race," "Human biological variability is continuously distributed; human biological classifications are [therefore?] arbitrary," "Menozzi, Piazza and Cavalli-Sforza (1987) showed that allele frequencies were overlapping with continuous distribution patterns, called clines, among populations," and "'let us not fall into the trap of *accepting* races as valid biologically discrete categories'[citing Sauer]." Presumably this is how "the concept of race was falsified by comparing the prediction of the hypothesis to empirical observation." I note that many other critics of race rest their case on the continuity of populations.

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By itself, this point does not impugn racial classifications, since many classification schemes draw borders through flux. The North Pole is regarded as "arctic" and Sarawak "tropical," although Sarawak can be reached from the North Pole by tiny steps no one of which is marked by noticeable climatic change. Despite continuous variation in stellar temperatures, astronomers put stars neatly into spectral types. Swedes may be grouped with Swedes and Bantus with Bantus so long as the mean Swede differs from the mean Bantu, despite the existence of intermediate individuals or fertile Swedish/Bantu matings. Certainly, observers will almost always noncollusively agree in classifying individuals by race. Appeal to continuity as a disproof of race needs the added assumption that races must be discontinuous – an assumption Bondi and Rickards never formulate explicitly and endorse only by implication: "'Variability does not conform to the discrete packages labeled races'" (citing Livingstone). Nonetheless, the assumption is critical.

And (to repeat), given that some arbitrariness and vagueness at the margins is tolerated elsewhere, it is not clear why populations must be biometrically or psychometrically or genetically discrete to count as races. Bondi and Rickards never say, and neither, to my knowledge, do other critics of race.

Actually, phenotypic or genotypic continuity is a red herring, since in its basic use race does not involve these factors, and is in fact not vague at all. 'Race" as understood by ordinary speakers and population biologists denotes the descendents of some individual or set of individuals, usually specified geographically. In particular, the conventionally recognized races – Negroid, Caucasoid, and Mongoloid – are, respectively, the descendants of sub-Saharan Africans, Europeans and Asians. This conventional conception must be adjusted to accommodate the successive branching of Europeans from sub-Saharan Africans and Asians from Europeans. Multi-region ancestries must also be provided for, but that is easy enough; a part-Asian part-Caucasoid is to be described in just those terms. (No-one can now guess what hard-to-classify monsters may someday be genetically engineered.) But these refinements aside the concept of race is clear, definite and operational. Races as commonly understood are clades defined by continent. That is all there is to them. Hence, unless one is prepared to deny the

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existence of sub-Saharan Africa, Europe and Asia, races plainly exist. Authors cited by Bondi and Rickards complain that race is unsuitable for explaining human variability, but race is not supposed to be explanatory. It is classificatory – it groups people by geographical origin, which may correlate with genetic factors that do help to explain variability but is not itself causal and need not be thought of as such.

Ancestral groups need not be identified by continent. Narrower regions can also be used, in which case more races will be recognized. Biondi and Rickards allude to this proliferation as an embarassment for racialists, but it is not, since the three-fold scheme of common sense is wholly consistent with more refined ones, just as the ordinary division of continents is consistent with recognition of countries within and across them. It is no embarassment to geography that Europeans can also be Italian. Thus, there are four races when individuals of north Asian ancestry are distinguished from those of south Asian ancestry, five races if furthermore individuals of northern European ancestry are distinguished from those of southern European ancestry, and so on.

This freedom to choose geographical criteria may seem to support the charge that races are arbitrary, hence scientifically unsound, but that charge must be brought with greater care than Biondi and Rickards exercise. They refer to the initial acceptance of the race concept as a "scientific fallacy," by which they seem to mean that the existence of race is, or was, empirically untestable – not "a hypothesis amenable to empirical investigation. . . [F]or about two centuries physical anthropologists refused to be led by the only criterion of truth that natural sciences recognize, namely empirical validation." Quite apart from what "fallacy" – that is, a tempting but invalid inference – was committed, this complaint is doubly confused. Testability is a property of statements, one, we may grant, that every scientific statement should possess. Every scientific statement should, by itself or together with additional uncontroversial assumptions, imply some observable outcome whose occurrence will confirm the statement and whose nonoccurrence will disconfirm it. But since a classificatory system, whether of the races of man or terrestrial climate zones or anything else, is not a statement, it implies nothing, hence is not so much as a candidate for testability. That Jupiter is a

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planet rather than a star is a statement (and one subject to test); the division of heavenly bodies into star/planet/asteroid/meteor/comet is not. Although parts of science, classificatory systems are no more testable than spectroscopes. So it is, first, inappropriate to judge race by criteria appropriate to hypotheses; and, second, while the vagueness of racial boundaries may represent a difficulty of some sort for the race concept, this concept cannot have been "falsified by [comparing] prediction to observation."

This confusion may also account for Biondi and Rickard's remark that "For anthropologists involved in forensic medicine the concept of race means everything and nothing. . . if race is everything, it is able to explain nothing." The remark is puzzling because racialists do not use race to explain "everything," and the critics Biondi and Rickards cite are at pains to point out what race *doesn't* explain. Perhaps their thinking is as follows. Popper and other empiricists have long urged that unfalsifiable hypotheses, those flexible enough to accommodate any experimental finding, are actually devoid of meaning and therefore cannot explain any data, even those they (appear to) entail. What "explains" everything explains nothing. Since Biondi and Rickards regard the old race concept as untestable, they may conclude that it must be vacuous as well.[2]

A reflective critic might grant that racial categories are not testable hypotheses, and that races do exist in the obvious sense that there are people of Sub-Saharan African, Asian and European ancestry. His claim, rather, is that these categories have turned out to be scientifically sterile, unenlightening, and unrelated to the actual causes of human variation. It is in this sense that race has been "falsified."

However, racial categories, while not the last word in understanding human variation, are a useful first word. Even Biondi and Rickards (and the authors they cite, such as Brues) recognize population differences in gene frequencies, raising the prospect that genes with respect to which populations vary

[2] Their contrast of induction to hypothesis-formation, although currently fashionable, also strikes me as ill-taken, since unobserved entities and processes are often based on inductive extrapolations from experience. Light waves were postulated because of a similarity between shadows and water waves. Moreover, "The generalization from the observed biological variability of humankind to the concept of race" is not clearly inductive in the intended pejorative sense.

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may contribute to important phenotypes. The empirical evidence favors this prospect, in two ways.

The first is that, as Biondi and Rickards are doubtless aware, Cavalli-Sforza and his co-workers have calculated and factor-analyzed the genetic distances between dozens of human populations. These populations turn out to cluster into what Cavalli-Sforza, Menotti and Piazza fastidiously call "major groups," the sub-Saharan African, Caucasian, East Asian and South Asian populations. Additionally, each sub-Saharan African population is farther from any non-sub-Saharan African population than any pair of non-Sub-Saharan African populations are from each other. Ordinary perception is thus congruent with underlying genetic reality.

Second, evidence continues to accumulate of group differences in heritable traits.[3] Some of these differences – in skin reflectance, body build, and facial bone structure – are, once again, obvious to ordinary perception. Others, for instance in twinning rates, are less widely recognized but familiar to anthropologists. Still others, such as race differences in response to certain medications,[4] are just now being verified. And of course discussion continues of differences in heritable cognitive abilities and personality traits which parallel continental clades – with north Asians tending to be most intelligent and least impulsive, Africans least intelligent and most impulsive, and Europeans intermediate. I will not pursue this latter topic except to note that rejection of these latter differences is virtually all conceptual in character: Critics deny the validity of psychometric tests, or the causal significance of heritability, or the very reality of psychological traits, but the empirical facts of low African and African American IQ test scores and high income for north Asians worldwide go largely unchallenged. To the extent that the issue is empirical, the data all support the validity of racial distinctions.

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[3] See my *Why Race Matters* (Praeger, 1998) for some discussion. Rushton 1995 cited by Biondi and Rickard is another good source.

[4] See e.g. D. Exner et al, "Lesser Response to Angiotensin-Converting-Enzyme Inhibitor Therapy in Black as Compared with White Patients with left Ventricular Dysfunction," *New England Journal of Medicine* 344 (May 3, 2001): 1351-1357.

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The Debate on Race: A Problem of Semantics Rather than of Biology

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The author surveys the history of the race concept, and suggests that much misunderstanding has arisen due to semantic confusion. To understand the significance of race in the study of man it is necessary to remember that the essence of the concept is heredity, and that the emphasis should at all times be placed on lineage and descent groups rather than on geographical populations.

Key Words: Race, speciation, species, sub-species, geographical races, gene pools, breeding populations, descent groups, phylogenetic continua, population genetics, DNA, Linnaeus, Darwin, Max Weber

Charles Darwin recognized the existence of human races and was fully aware of the antiquity and significance of human racial differences. His cousin, Sir Francis Galton, with whom he regularly corresponded, had carried out extensive research in the Middle East and Africa, and had already expatiated on the remarkable differences between the various populations which inhabited the world in his day. Although he was not aware of the genetic mechanisms subsequently revealed by Mendel, Darwin realized that the principles which governed speciation amongst plants and animals also governed the human animal. But conscious in advance of the resistance that his exposition of the evolutionary roots of mankind was likely to attract, in 1857 wrote to the co-discoverer of evolution, Alfred Russel Wallace, saying:

> You ask me whether I shall discuss 'man.' I think that I shall avoid the subject, as so surrounded with prejudices; though I fully admit it is the highest and most interesting problem for the naturalist. (Letters of Darwin to Wallace)

Later, however, in The Descent of Man and Selection in Relation to Sex (1871) he made it very clear that human race differences were in his opinion very substantial, commenting on

> ...the enormous range of man, which is a great anomaly in the class of mammals, if mankind be viewed as a single species.

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Man, he explained, has:

> ...diverged into distinct races, or as they may be more fitly called, sub-species. Some of these, such as the Negro and European, are so distinct that, if specimens had been brought to a naturalist without any further information they would undoubtedly have been considered by him as good and true species. (1871/1874, p.929)

In chapter seven of that work he also wrote:

> ...the various races, when carefully compared and measured, differ much from each other – as in the texture of hair, the relative proportions of all parts of the body, the capacity of the lungs, the form and capacity of the skull, and even the convolutions of the brain. But it would be an endless task to specify the numerous points of difference. The races differ also in constitution, in acclimatization and in liability to certain diseases. Their mental characteristics are likewise very distinct; chiefly as it would appear in their emotions, but partly in their intellectual faculties.

The reality of evolution, as revealed by Darwin and Wallace's virtually simultaneous discoveries, is now universally accepted amongst scholars. But the opposition these early investigators of evolution faced from religious critics has been replaced by an equally widespread resistance by present-day egalitarian ideologues to research aimed at exploring the history or extent of group differences between the modern races of man. Indeed, in extreme form, we see strenuous efforts to deny even the reality of race. It may not perhaps always be due to careless scholarship that when reference is made to Darwin's epoch-making Origin of Species by Means of Natural Selection (1859) in current literature, the second part of the title he gave to this work, "or the Preservation of Favored Races in the Struggle for Life," is seldom mentioned. But the fact remains that many graduates of today's universities have never even heard of the full title, and that in current literature the term "race" is used in so many different ways that the "debate on race" is bedeviled by semantic confusion.[1]

[1] Such is the confusion that Bernard D. Davis, a senior professor of Harvard Medical School, found it necessary to remind readers in his Storm over Biology (1986) that "long-separated populations, subject to the pressures of different environments, will accumulate statistical difference in genes that affect behavioral

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As a result of this confusion, some writers, such as Livingstone (1962), Brace (1962) and Montagu (1965) have called for the elimination of the term race, and as early as 1937, when National Socialist Germany was coming to be perceived as a threat, J. S. Huxley and A.C. Haddon suggested the replacement of the word race by the term ethnic group, but thirty years later the renowned biologist Ernst Mayr (1969) was still using the term race in the sense of subspecies. Others, such as Garn (1961) and Dobzhansky (1962)) saw race as synonymous with breeding population, and suggested that the concept should not be abandoned, but should be redefined in terms of population genetics.

If we wish to use the term race as in the traditionally most popular sense of subspecies, we must ask what is a subspecies in zoological terms? Possibly the best definition is that given by Mayr in his Animal Species and Evolution (1963: 348): "a subspecies is an aggregate of local populations of a species, inhabiting a geographic subdivision of the range of the species, and differing taxonomically from other populations of the species." But human races are no longer geographically segregated, and may not have been for several millennia. So we need to look somewhat further than analogies with animal species, even though race is a biological term, and we will only add to the confusion if we forget that.

Race as an Inbreeding Descent Group

In my 1974 Introduction to Anthropology I took the easy way out, and defined race in traditional terms, saying that "it is generally agreed that a race is a breeding population whose members share a number of distinctive genetic characteristics which distinguish them from the members of other breeding populations ...an evolutionary experiment which has developed a high degree of genetic exclusiveness and which, in a natural state, night be expected to evolve into a new and distinct species, losing the ability to interbreed with other races. Unfortunately the reality [in the case of humans] is not as simple as that ...in most cases we are not dealing with populations or gene pools which have been totally isolated for long periods of time."[2]

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potentials, just as in their other genes." (p.50)

[7] Roger Pearson 1973, *Introduction to Anthropology*, New York, Holt, Rinehart and Winston, p. 136. My discussion of species in my *Anthropological Glossary* failed

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When used in Darwin's time, and indeed even prior to the nineteenth century, the word race still customarily laid stress on intergenerational lineage, on the idea of the largely inbreeding descent group. And even today, a race can best be conceptualized in terms of an intergenerational descent group, a large extended family that inbreeds to sufficient extent that its members share distinctive identifying biological characteristics. As a lineage, there is nothing static about a race: human races are breeding populations which like all other living things can evolve through time, each at their own rate and in their own direction – in the direction of whatever qualities prove to be most successful in enhancing the survival chances of its members. On the other hand, we should not forget that races can become extinct if they lack the qualities necessary to compete successfully with rival populations which seek the same resources. The history of hominid evolution is littered with races that failed to compete for territory and the vital resources which control over a territory conveys.

Speaking etymologically, we find that as early as Anglo-Saxon times the word ræs, from which our modern English word "race" derives, connoted a flow or movement from one place to another, as in "horse race" or even "mill-race" (the stream which drives the wheel of a water-mill). Without becoming involved too deeply in historical linguistics, let us look at the definition of the word "race" in the Concise Oxford English Dictionary:

> **race**, n. Onward sweep or movement, esp. strong current in sea or river.
>
> **race, n.** Group of persons or animals or plants connected by common descent, the posterity of (person), house, family, tribe

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adequately to stress the intergenerational nature of all zoological taxa, but nevertheless touched on this aspect in its definition of a species as "a group of living organisms that share a marked degree of genetic homogeneity and consequently resemble each other closely. No comprehensive and universally satisfactory definition of a species exists, but geneticists frequently use the term to refer to distinct populations that are unable to reproduce except with their own kind. Subspecies would thus be defined as subdivisions of species, whose members resemble each other in the possession of distinctive genetically-controlled characteristics which set them apart from other members of the species with whom they seldom interbreed for psychic, geographical, or other reasons, even though they still retain the potential for fertile crossbreeding within the species. *From the evolutionary point of view, subspecies that preserve their genetic isolation eventually become separate species.* The hominid races may be regarded as subspecies."

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or nation regarded as of common stock, distinct ethnical stock (the *Caucasian, Mongolian.*, & p.),, genus or species of breed or variety of animals or plants (*the human, feathered, four-footed, finny, etc.*); descent, kindred (*of noble, Oriental, etc r.; separate in language & r.*); class of persons &. with some common features (*the r. of poets, dandies, &.*).

The concept of race had evolved in the sense of an intergenerational breeding community long before biological science had devised the term which most clearly lays stress on the lineal aspect – "phylogenetic continuum." Indeed, in folk history the primary concept behind the thought of race was always that of a lineage, a descent group. We find references, for example, to the royal race of athelings, or, as in the Nibelungenlied, to the race of the Nibelungs, the descendants of a distinctive individual or group, a lineage tracing descent from some known ancestral figure. The emphasis was on generations succeeding each other through time, rather than on a physically identifiable population inhabiting a particular area at any one moment in time, although with inbreeding the former implied the latter.

From the earliest recorded pre-Christian times there was a clear recognition of the importance of heredity in most early European cultures, and a strong recognition of the importance of heredity, of the potency of the qualities which were transmitted from one generation to the next, from the ancestors to the living and from the living to posterity.[3] Race referred to the flow of life down through the generations and by extension to the intergenerational descent group derived from a specific progenitor or group of progenitors. With ancestor worship – or even just a strong sense of ancestor reverence – as a preeminent component of pre-Christian European culture,[4] the members of such a descent group were perceived as sharing the same almost supernatural spark of life; and would in all probability share distinctive, identifying physical and maybe even behavioral characteristics. Consequently, the word race easily acquired a powerful significance, identifying both the successive generations of descendants of the often eponymous ancestor or

[3] See my comments in chapter one of *Heredity and Humanity* (1996).

[4] For the significance of race in ancient Greek society and household religion see *Family, Kin and City State*, N.D. Fustel de Coulanges and J. Jamieson, 1999, Washington D.C., Scott-Townsend Publishers.

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ancestors, and also the contemporaneous band of related individuals belonging to that descent group who, because they derived from the same gene pool, would tend to resemble each other fairly closely.

Race implies lineage above all else, and everyone owes their genes to the past. Race is an historic, causal reality which properly investigated can help clarify the diversity that exists in even the most mixed populations of today. The enormous variety of alleles found in human genes owes its origins in no small part to racial speciation, and is by no means spread uniformly throughout mankind. No serious scholar denies this, the only problem is by what terms do we designate the ethnic taxa which still distinguish diverse human populations from each other? Man is a biological animal, a member of the taxon Mammalia. Customarily Mammalia are divided into classes, orders, families, species and subspecies, the latter having customarily been termed races in the case of man. But it is at this level that dispute over terminology has arisen because in the case of *Homo sapiens* few sharply defined barriers against crossbreeding between separate populations have survived.

John R. Baker (1981), the distinguished Oxford Zoologist, describes race as a minor taxon in relation to the species, but warns that "one repeatedly finds the need for a comprehensive term that can be used without distinction for any of the taxa that are minor to the species."[5] Because of the confusion resulting from attempts to identify subraces or minor ethnic taxa within the major races he suggests the term stirps as being free from the confusion which has arisen in the course of time over both the words race and ethnic (the latter often referring to purely cultural differences). Another zoologist, Goran Strkalj[6] has suggested the use of the term form in place of race in order to avoid the semantic confusion that bedevils all discussion of the fact that genetic diversity is unevenly distributed amongst human populations.

Human Speciation

Because of the high degree of geographical isolation of human populations prior to, and even as late as, Neolithic times,

[5] John R. Baker, 1981, *Race*, pp 4-5.

[6] Goran Strkalj, "Form and Race: Terminological Concepts for the Study of Human Variation", *Mankind Quarterly*, XLI: 4, pp 109-118.

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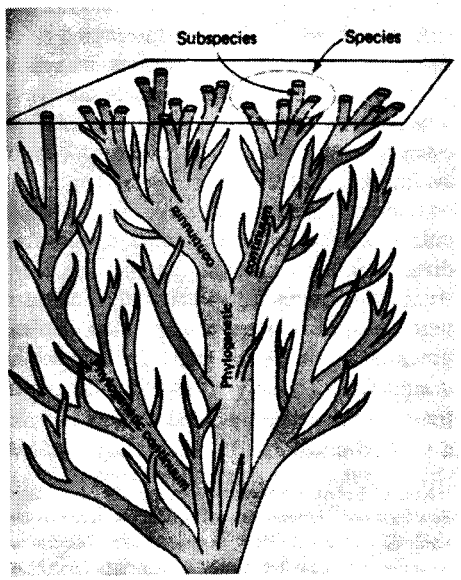
early proto-human and human gene pools tended to remain fairly constant and consistently reflected distinctive breeding populations or lineages, so that racial differences between the diverse human groups inhabiting the world prior to the invention and spread of agriculture were probably greater and more clear cut than they are today. There would be very little genetic admixture between the members of populations living, say, in northern China, sub-Saharan Africa, Australia or the Americas. This does not mean that migration and some degree of genetic admixture did not take place in the Paleolithic, as also possibly amongst pre-human hominids, but relatively long-term genetic isolation combined with a diversity of selective forces in different environments would maximize homogenization within the local group and work constantly toward the formation of subspecies and phylogenetic diversification on the global scene.



Diagrammatic representation of "races," subspecies and species as evolutionary (intergenerational) realities, and as they appear in relation to each other to an observer at any one moment in time (from Roger Pearson, Introduction to Anthropology, Holt Rinehart and Winston, 1974).

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Consequently, when European voyagers began to explore the broad continents which lay beyond Europe they could not but be impressed by the remarkable divergence of physical types which they encountered in these new lands. And when in the eighteenth and nineteenth centuries European scholars attempted to classify the diverse peoples of the world, they soon came to use the term "race" to identify geographically separate groups of people, comparing living populations with each other on the basis not only of their cultures but also the sharp morphological differences they observed. Faced by the geographical extent of the task they faced, instead of conceptualizing race as the longitudinal strands in a rope symbolizing humanity evolving through time, they were tempted to perceive race more in terms of what a cross-section of the hypothetical rope would look like if cut through at their own moment in time. The emphasis came to be placed on the latitudinal classification of living peoples, rather than on ancestry. The evolutionary, lineal character of race tended to be overlooked by some observers, especially those steeped in the biblical myth of Creation.[7] The result was a tendency to see race in static geographical terms. This was not at all the traditional idea of race, which was more in keeping with the evolutionary reality, and it led to much confusion that has been fertile ground for those who seem to deny the reality of group differences amongst the living representatives of *Homo sapiens.*

Race as the Causal Explanation of Human Diversity

As Biondi and Rickards correctly point out in their article in this issue of *The Mankind Quarterly,* any attempt to produce a simple classificatory system that would make it possible to place every living individual neatly into one or other of a rigid and mutually exclusive set of racial categories must fail. But this does not mean that race is not an essential concept for scientific investigation into the evolutionary history of mankind. The concept of race, in the sense of a largely inbreeding phylogenetic continuum, remains essential to any attempt to trace the evolutionary history behind contemporary human

[7] I must make it explicitly clear, however, that most responsible scholars never fell into this error. See for example, S.M. Garn (1961), C.D. Darlington (1964) and J.R. Baker (1974). The work of Carleton Coon is exceptionally well known in this respect, and is discussed below.

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diversity.

Human diversity evolved in the same way that diversification and speciation took place amongst all other life forms. When a parent population expanded and sent migrant groups into new ecological niches, the colonial populations would likely evolve in somewhat different directions, so that after a number of generations a genetic map of the now dispersed populations would reveal what Carleton Coon (1954, 1962, 1964, 1965) called an "intraracial cline" – an increasing degree of genetic variation becomes apparent as our focus transits from one end of the ecological spectrum to the other. Alternatively, a population which develops a more advanced technology might well expand into territories occupied by other racial types and, if not driving the proprietary populations into extinction, might interbreed with these and thereby create a new gene pool representing a mixture of the two disparate parent populations. Coon described the genetic gradient that resulted from such admixture in the marginal area located between the two geographical extremes of genetic variation as an "interracial cline." The term "interracial" referred to hybrid populations which resulted from an admixture of two genetically different race groups, while an "intraracial cline" referred to the genetic variation which resulted from natural selection operating on colonies subjected to new and different environmental pressures not experienced by their parent group.

Racial clines have complicated modern efforts to reconstruct racial history by comparing the gene pools of different populations and calculating the genetic distance between these populations. Clearly, intraracial clines result from speciation, they are produced as a result of an evolutionary process, but interracial clines result from crossbreeding as a result of genetic migration (where invaders or immigrants mix their genes with the former proprietors of a territory). Where genetic diversification represents an intraracial cline, the genetic distance between two populations is a result of racial branching, but interracial clines represent the reverse of evolutionary speciation – intraracial clines indicate an admixture of populations which had begun to evolve separately, a process which means the nullification of an evolutionary experiment. In both cases, the genetic relationship between the populations under study can be accurately represented by a dendrogram, a

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tree illustrating the degree of genetic relationship, but only in the former case the result will it be a phylogenetic tree, not in the latter.

Race as a Valid Weberian Classification

Nineteenth century scholars understandably attempted to classify contemporary humanity in accordance with the principles defined by Carolus Linnaeus (1735, 1789)[8], in particular dividing living *Homo sapiens* into three or more major "races," and thence into smaller subraces. This was an intellectual exercise which had a basis in evolutionary history, and even though the genetic borders between races are often marked only by the genetic clines described by Coon, the classification of living human populations into broad Weberian categories has practical utility and is based on sound classificatory principles

Classification is a necessary conceptual step in the analysis of any body of data, and when the component elements are not always sharply distinct this can be facilitated by classification of the data, and for that we need to make use of a system of conceptual models proposed by Max Weber and described by him as "ideal types."

A Weberian ideal type is "ideal" only in the sense of "ideational." The descriptions physical anthropologists gave us of diverse ethnic or racial types were Weberian "ideal types," representing a concoction of those characteristics that most clearly distinguish any one breeding population from all others. Weberian ideal types do not represent the average qualities of a population, and although some members may match its specifications completely, it is not to be expected that all, or even any, will do so exactly – indeed, it would be surprising if more than a few did. Weberian race types such as "Caucasoid," "Australoid," "Melanesian," or "Northern Mongoloid" terms are useful in both popular and scientific communication in that they help us to find our way through a mass of data by highlighting those qualities that most clearly distinguish one breeding population from the others. But in scientific usage they are only classificatory tools, and are in no way to be

[8] For a more detailed explanation of Weber's concept of the use of "ideal types" in scientific classification see *Max Weber's Sociology of Intellectuals* by A. Safri (1992).

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regarded as "ideal" in the sense of "perfect" or desirable. The latter would be a matter of subjective judgment, not a scientific statement of fact.

It is true that in matters of race the German national socialists selected one Weberian "ideal type", the Nordic, as their "ideal" in the latter sense of the term – as their desired ideal. They, and other exponents of the "Nordic Ideal," conceptualized the Nordic as the type of man and woman they regarded as furthest removed in appearance amongst all living humans from our anthropoid forebears and living simian kinfolk.[9] To them the Nordic man and woman "ideally" had blue or grey eyes and fair, fine hair, a high forehead, a non-prognathous profile, a clearly defined chin, and generally delicate facial features including, especially, a sharply chiseled nose and thin, non-flaring nostrils. The skin also was lightly colored, allowing the blood to show through, giving it a pinkish, rosy hue and showing emotions easily, as when blushing.[10] That subjective sense of the Nordic as a racial ideal has understandably raised resentment amongst many who inherit physical qualities other than those described, and this is probably a major factor behind the contemporary prejudice against the identification of any or all race types. Indeed, Biondi and Rickards' imply that the study of race is liable to promote racism, and this appears to be one of their main reasons for writing their present essay.

But "race" in the sense of a Weberian ideal type is a rational scientific tool, a neutral conceptual technique that is entirely logical. Weberian race-constructs and the labels we give them are as valid as the terms that we use to identify the colors of the rainbow – which are also Weberian ideal types. Red, yellow, green, blue and violet all merge into one another in reality, but their use as classificatory terms is invaluable in our daily lives: in their extreme forms they can easily be identified by the human

[9] We should mention here that there are a number of characteristics that are unique to various human races, and which are totally unrepresented amongst non-human primates. For example: the epicanthic fold of Mongoloids, who regard Caucasoids as having "dog-eyes," and the tightly curled "peppercorn" hair form of some sub-Saharan African peoples, not found amongst Caucasoids, Mongoloids, Australoids, Amerindians or any non-human primates.

[10] This description actually corresponded closely with the description widely accepted amongst physical anthropologists. See, for example, page 27, A.C. Haddon, *The Races of Man* (1925), reprinted 2002, Scott-Townsend Publishers.

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eye, and as recognizable types they help us to organize our understanding of color. Similarly, the concept of race, of predominantly inbreeding genetic continua by whatever name we might care to give them, has undeniable utility to any researcher who seeks to trace the recent evolutionary history of mankind – notwithstanding the increasingly confused and intermixed character of many contemporary Western populations as a result of the recent increase in human migration.

The fact that there are genetic gradients linking the different Weberian extreme of human populations, both interracial and intra-racial to use Carleton Coon's terms, does not mean that the identification of "ideal types" for the study of human populations is not as valid as the use of terms such as "hot", "tepid", and "cold", when speaking of temperature, or of mountains and valleys when describing undulations in the surface area of a continent. Mountains are linked to each other by land bridges, and are shown as contours on maps – the geographical equivalent of the genetic gradients which Coon called intraracial clines. Although joined in a single land mass, mountains, like races, are nevertheless identifiable and meaningful categories. Science proceeds by way of classification, and there are good causal reasons, evolutionary and biological, why the use of race terms makes sense in the study of anthropology.

Are Human Races Subspecies?

The attempt to equate human races with subspecies as they are found amongst non-human populations was much discussed in the eighteenth century[11] and survives to this day as a result of semantic confusion as to the definition of species. The prevailing dictum is that subspecies are distinctive populations which have not yet lost the ability to produce fertile offspring when crossed with members of other subspecies within their own species; while species are customarily assumed to have evolved to such a point of distinctiveness that they are unable to interbreed to produce fertile offspring. Thus by this definition the horse and donkey, although phylogenetically or racially

[11] See amongst other essays "The Species Problem: The Nineteenth Century Concepts of Racial Inferiority in the Origin of Man Controversy" by John S. Heller Jr., 1970, *American Anthropologist*, 72: 1319-1329

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related, are regarded as belonging to different species because when crossed their offspring, the mule, is normally infertile. And as we know, all extant human populations are mutually fertile when cross-bred. Hence, despite the fact that living human populations differ from each other in greater measure than many recognized animal species differ biologically from each other, all living human populations are said to belong to the same species.

Darwin early recognized this problem, and explained that populations which evolved in isolation over a long period of time tended to lose the ability to interbreed with other related populations, but that before the biological potential for inter-group fertility was actually lost, a "mutual repugnance to pairing" might develop:

Even a slight degree of sterility between any two forms when first crossed, or in their offspring, is generally considered a decisive test of their specific distinctness, and their continued persistence without blending within the same area is accepted as sufficient evidence, either of some degree of mutual sterility, or in the case of animals of some mutual repugnance to pairing. [1871] (1927): 169-170.

Thus the definition of a species on the basis of biological fertility is not truly parallel to the broader scheme of biological classification of the non-human world. While in a feral state, different animal populations do not interbreed, often not because they are biologically capable of interbreeding but because of "mutual repugnance," non-biological, seemingly psychological, "feral constraints." However, when members of various animal species have been domesticated, or when their normal feral conditions of existence have been disrupted by capture and incarceration, as in a zoo, their feral constraints against attempting to crossbreed with members of other subspecies, or even species, often break down.

If we define species on the basis of fertility, we need to base our decision not on whether crossbreeding is biologically possible, but whether it crossbreeding does in fact occur. Amongst any two races animals living in a feral condition, crossbreeding may often be a biological possibility, even though it seldom occurs as a result of essentially psychological feral constraints. Where evolving populations occupy the same geographical area, they can only evolve to the point where they

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lose their biological ability to be mutually fertile if they have first developed a psychological repugnance to crossbreeding. Race prejudice, in other words, played a vital role in the process the evolutionary speciation. It may also have played a role in hominid and human speciation, until it declined as a result of the weakening of the "territorial imperative" and accompanying cultural factors.

It is well known that when feral conditions are nullified by domestication, feral constraints cease to operate amongst animals. Domesticated animals will willingly crossbreed with different subspecies, or even attempt sexual relations with members of totally different species. Domesticated horses, dogs and cattle exemplify such behavior. Domestic dogs pitifully attempt to mark out their territories, but without much success, and notoriously show little or no feral restraint against crossbreeding with other subspecies. Non-domesticated animals have also been known to crossbreed when removed from their natural, feral environment and placed in zoos. In the case of mankind, the rise of highly complex cultures has in a sense "encaged" man,[12] overriding most feral constraints, including even territoriality to a greater or lesser degree, and we do not know how far we would have to go back into prehistory to trace the decline of feral constraints amongst humans, or even of hominids, against crossbreeding with other human or hominid subspecies.[13]

Circumstantial arguments that our early ancestors were governed by feral constraints that discouraged crossbreeding are suggested by the claims of those geneticists that as early men spread across the face of Asia, no inbreeding took place between them and the older populations which they supplanted. In short, the proponents of the strict version of the "Out of Africa" theory claim that our earliest modern forebears were totally racialist in their attitude towards any of the more primitive populations they encountered as they spread throughout Europe and Asia.[14] However, the radical and narrow version of

[12] In this context see also D.F. Roberts and R.W. Hiorns, 1962, "The Dynamics of Racial Intermixture," *American Journal of Human Genetics, 14: 261-277.*

[13] See Klopfer, P. and J.P. Hallman, 1967, *Animal Behavior,* Prentice-Hall. Also Mayr, E., 1963. *Animal Species and Evolution.* Harvard University Press

[14] The "Out of Africa" thesis, which uncovered by genetic analysis the tropical/subtropical roots of mankind's earliest sapiens forebears, dramatically reveals the importance of tracing lineage to identify the roots of modern man. But

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the "Out of Africa" hypothesis is very much open to question as to timing and the number of waves of migration that may have taken place in prehistory. In particular it would seem that most of the racial distinctions we know today evolved after the migration of the ancestors of modern Caucasoids and Mongoloids from the presumed earlier tropical homeland, but as *Homo sapiens* shed its feral constraints against crossbreeding, its various racial elements seem to have lost any chance they had of evolving into biologically distinct species, and became mere elements in a single polytypical species, increasingly characterized by the sexual perversions found amongst domesticated animals.[15]

Population Genetics

Population genetics is nothing more than research into the racial structure and origins of man, as R. R. Guggles Gates made clear in his 1963 article in *Current Anthropology* entitled "Racial Genetics: A New Branch of Anthropology," and it was essentially in that spirit that many subsequent investigators have pursued genetic research[16] and research into blood groups,[17] DNA and other genetic markers is substantiating the findings of physical anthropologists regarding the legitimacy of race, and throwing much clearer light on race history.[18]

Amongst these N. Saitou of the Laboratory of Evolutionary Genetics at the National Institute of Genetics at Mishima, Japan, has identified six major racial groups dating from the beginning of the Holocene some 10,000 years ago, which correspond

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the conclusions published by Cann, R.L., M. Stoneking, and A.C. Wilson in their 1987 essay entitled "Mitochondrial DNA and Human Evolution." (*Nature* 325:31-36) may require substantial modification in relation to dating and other aspects in light of subsequent research.

[15] This may be an overstatement, when one takes into consideration the fact that some degree of feral constraint in the form of what we call racial prejudice is still to be found when massive migration brings contrasting ethnic groups, equipped with conflicting cultural values, into major confrontation with each other, as detailed by Laszlo F. Thomay in *The Natural Law of Race Relations* (1993)

[16] See also as classic examples the publications of T.E. Reed (1969), M. Nei and A.K. Roychoudhury (1982), and N.J. Sauer (1992), the latter being an article published in *Social Science and Medicine* under the title "Forensic Anthropology and the Concept of Race: If Races Don't Exist, Why Are Forensic Anthropologists so Good at Identifying Them".

[17] For an example of the use of blood groups to elucidate racial history, see the work of A.E. Mourant et al. (1976).

[18] In this respect, see, amongst others, A.R. Templeton (1998) Human Races, A Genetic and Evolutionary Perspective," *American Anthropologist,* 100: 632-650.

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roughly to traditional racial groupings as determined by anthropometrists. However, some researchers in population genetics remain reluctant to use the word race either because of the calumny that has been associated with it by political activists,[19] or because they genuinely fear that to validate race in the public mind may lead to "racist" conflict.

The fact that cautious scholars protect themselves by talking about "population genetics" – a perfectly valid designation in its own right – does not mean that they are not talking about race. On the contrary, they *are* talking about the contents of the diverse gene pools which are at the very root of race, and which determine the racial phenotype. Cavalli-Sforza and his colleagues in their epic *The History and Geography of Human Genes* (1994) similarly try to avoid 19th and early 20th century race terms to describe the clusters of biological variants that have resulted from the disparate phylogenetic histories of the populations they are studying. But they still encounter race patterns in the genes they trace, and find themselves racial variation, by whatever name it might be called.[20] They are admitting that significant racial differences exist when they declare that "the greatest differences within the human species is between Africans and non-Africans" (1994, p. 83). It might also be noted that they arrive at such conclusions despite the fact that few of the genetic markers they use have any direct relation to the phenotypical race characteristics (skeletal form, pigmentation, hair form etc.) used by anthropologists prior to the rise of population genetics. The fact that they are merely studying race under another name has been adequately shown by E.M. Miller in his 1994 book review article entitled "Tracing the Genetic History of Modern Man."[21]

Modern research in genetics is only continuing the work of the earlier physical anthropologists toward the same goal with increasing efficiency, despite the unsuitable political climate that prevails at this present time. Race can be readily inferred

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[19] The political bias behind attacks on scholars who investigate race and the misleading portrayal of race in the media has been amply documented in various publications, including my own *Race, Intelligence and Bias in Academe* (1991) and M. Snyderman and S. Rothman's 1988 publication *The IQ Controversy: the media and public policy*.

[20] For another critique of Cavalli-Sforza et al. see Glayde Whitney, 2000. "Races do Not Exist: So Study them.")

[21] E.M. Miller, 1994, *The Mankind Quarterly*, Vol. XXXV, Nos 1 & 2. pp.71-108.

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from the frequencies of alternative forms, or alleles, of genes. Allele patterns differ by racial origin, and modern genetics will enable us to trace the racial history of man, and even of individuals, much more effectively than our older more primitive anthropological methods could ever hope to do. Thus, researchers less fearful of political pressures are seeking to trace racial lineages far back into prehistory, based on DNA evidence found in fossil bones.[22]

An excellent example of the reluctance of contemporary researchers to discuss race in the greatest detail, while avoiding all use of the that fatal word, is to be found in the excellent text entitled *Genetics and the Search for Modern Human Origins* (John H. Relethford, 2001), which discusses phylogenetic models, phylogenetic branching, human populations, forms and groups, Europeans, East Asians, Australasians, Africans, and "the geographical distribution of human genetic diversity" while stressing that "we still retain the signature of past events in our genes," does so without once using the word "race."

As Shakespeare said, "What's in a name? That which we call a rose by any other name would smell as sweet." The psychologists J. Philippe Rushton and Richard Lynn have shown us in numerous publications the far-reaching implications of race,[23]

As forensic anthropology has shown us, the race of a man or woman can be easily identified, except in the case of a highly hybrid individual, by examining their genes.[24] There are a multitude of DNA sequences, such as Short Tandem Repeats (STRs) and Single Nucleotide Polymorphisms (SNPs) that differ between races. Thus numerous SNPs that are common in sub-Saharan Africa are completely absent amongst Caucasians and Mongoloids.[25] A survey of such markers enables one to identify

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[22] For example see the work of K.A.R. Kennedy and J. Chiment (1992). which discusses "Racial Identification in the Context of Prehistoric-Historic Biological Continua."

[23] See psychologists J. Philippe Rushton, *Race, Evolution and Behavior* (1995) Glayde Whitney, "On the Reality of Race" (1998), R. Lynn "The Evolution of Racial Differences in Intelligence" 1991.

[24] See for example, Sauer, N.J. 1992. "Forensic Anthropology and the Concept of Race: If Races Don't Exist, Why Are Forensic Anthropologists so Good at Identifying Them". *Social Science and Medicine* 34:107-111.

[25] For more on this see Shriver, M.D., Smith, M.W., Jin, L., Marcini, A., Akey, J.M., Deka, R., & Ferrell, R.E. "Ethnic-affiliation estimation by use of population-specific DNA markers." *American Journal of Human Genetics*, 60, 1997

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the race of an individual with precision. It is therefore nonsense to say that race is not a biological reality, but only a cultural invention. Race by any name is a biological reality that has acquired a wide range of cultural associations. What is more it is a biological reality that can be shown to have significant behavioral implications. Sub-Saharan African Negroes tend to have more dense bones and to develop more powerful muscles than Caucasoids or Mongoloids, and so have a natural advantage in boxing, others due to their height have an advantage in basketball. But mathematicians are more commonly found amongst Caucasoids or Mongoloids. Behavioral potential resides in the genes.

Concluding Remarks

As we move into the future, ongoing genetic admixture between individuals belonging to different phylogenetic lineages seems likely to occur at an increasing rate, until the diverse racial components of human history, prehistory, and the contemporary world, could conceivably become so genetically intermixed that lineage becomes virtually untraceable. At the rate of crossbreeding in the Western world today, the term 'race" could conceivably cease to be useful when applied to future Western populations. One suspects that some who deny the reality of race may hope that if the fictions about the non-reality of race which they sustain can be maintained for a sufficiently long period of time, human populations will indeed become so hopelessly admixed that race will cease to exist as a significant factor in human affairs.

Many "race-deniers" probably believe that by reducing "race consciousness" amongst contemporary human populations they will be advancing a dream future in which human strife will be minimal or even non-existent. There may be something in this, although the present writer suspects that other factors promoting inter-human conflict will ensure that it proves to be a vain hope. And it should be remembered that while Western populations are tending to abandon traditional mating prejudices and other forms of race prejudice, the majority population of the non-Western world is more strongly oriented toward retaining such prejudices, so that it may be primarily the "white" or Caucasoid population of the Western world that will become hybridized first. Yet even if the present populations of the Western world become inextricably confused, the majority

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of members of the vast and highly fertile populations inhabiting the Asian continent, such as China, may be expected to retain their distinctive genetic phenotypes far into future generations. And the same may well be true of the bulk of the inhabitants of sub-Saharan Africa.

That will be as it may, but since evolution has always proceeded by way of diversification, speciation and competitive selection between groups as well as between individuals, global homogenization of the human species may come at a very high cost. There is no inevitable rule that selection has always resulted in the survival of any one species, and the record of evolution tells us that in the past, whenever variety in a polygenic species has declined until the species comes to be represented by only a single subspecies, that species may be drawing close to extinction. Multitudes of promising subspecies and species *have* fallen into extinction. The survival of mankind as a species is by no means assured, any more than the survival of this earth as a habitable portion of the universe is assured. But that is all the more reason why we should not allow ourselves to be deterred from seeking to see reality more clearly, or to allow blind prejudices to stop us from any kind of scientific investigation, including investigation into the evolutionary history of the living races of man. Ideologies and cultural mores that lack Darwinian justification are evolutionary perversions that can only distort our perception of reality, and thereby handicap the long term survival chances of our species.

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The Role of Rhythm and Mode in Emotional Responses to Hymn Tunes

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Music has been described as the language of feelings, and it is found in virtually every culture and historical period. It has also often been cited as a trigger for powerful emotional or numinous experiences, including those occurring in a religious setting. This study investigated the differential emotional-spiritual impact of hymns in major and minor modes, and triple and quadruple time, during regular Anglican church services. Significantly higher scores were obtained for hymns in triple time than in quadruple, but there was only a non-significant trend for the superiority of minor over major modes. There were no significant gender differences in scores. Specific aspects of music are difficult to partial out from the holistic composition. Rhythm has been cited as a particularly important element in excitement generation and tune recognition, but research reports are sparse. The fact that triple rhythm frees the listener from the regular beats associated with biorhythms may be a relevant factor in its emotional impact.

Key Words: Religious music, religious emotions, spirituality, rhythm, melody.

This study was designed to investigate emotional-spiritual reactions to different modes and time signatures of hymns played and sung during regular church services. It thus attempted to use scientific methodology to study variables that do not readily lend themselves to formal, quantitative research.

Music is a non-verbal medium of communication: the language of feelings (Gabrielsson, 1993). Storr (1993) speculated that it might have originated in the verbal exchanges between mothers and babies, and that it may have predated speech. Trehub, Trainor and Unyk (1993) stated that music is found in every culture and historical period; the discovery of bone flutes dating back 50,000 to 67,000 years lends support to this (Storr, 1993; The Times, UK, 5th April 1997). Music generally comprises melody, harmony, rhythm, and timbre, with a number of secondary components such as tempo or loudness

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(Bernstein, 1976).

Strong emotional responses to anomalous or numinous events, particularly in religious contexts, have probably occurred since pre-history (see review by Liester, 1996), and reports of such appear in early texts of both Eastern and Western religions. Somewhat more recently, a variety of phenomena have been described which could conceivably be subsumed under the heading of altered states of consciousness – that which represents a sufficient deviation from general norms for a particular individual during alert, waking consciousness (Kokoszka, 1992). Examples include "peak experiences" (Maslow, 1962), "flow"(Csikzentmihalyi, 1975), and "thrills" (Goldstein, 1980).

Perhaps surprisingly, studies often suggest that such experiences in general are not particularly rare. An overview by Kokoszka (1992) cited incidences ranging from 9.8% to 82% depending on the nature of the question asked. Goldstein (1980) obtained affirmative responses of from 53% to 90% ("thrills"), and Hay (1990) reported that 35% to 65% of his participants confirmed they had experienced the presence of a power, whether or not this is attributed to God. A survey among members of a university staff by Lowis (1998) found that 85% of the 364 respondents admitted to at least one experience described in terms similar to those used by Maslow to describe "peaks".

Music is often prominent among the triggers or antecedents cited for powerful emotional experiences. Maslow (1962; 1971) stated that one of the most frequently implicated precursors was music (the classical variety). Greeley (1974), from responses to a question concerning the experience of powerful, spiritual forces, found that music was implicated by 49% of his respondents. The survey by Lowis (1998) revealed that playing a musical instrument was the trigger for 11.8% of experiences occurring whilst in an "active" state, whereas listening to music was implicated in 55.1% of cases occurring in a "passive" state.

The reason why music should so frequently and powerfully elicit strong emotional reactions is far from clear. Certainly a pertinent factor is that, through a process akin to classical conditioning a piece of music may, on subsequent hearing, rekindle the emotion of a significant extra-musical event where it was previously heard (Dowling & Harwood, 1986; Trehub &

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Schellenberg, 1995). Examples could be weddings, funerals, or a first date ("darling, they are playing our tune!").

There has been much Debate on whether or not music can actually convey emotions to the listener and, if so, whether this could be due to "inherent characteristics" of the piece or, alternatively, is simply a product of deliberate compositional technique. The composers Stravinsky and Hindemith are among those who believe that melodies could be constructed rationally, utilising experience of what musical patterns are likely to suggest or invoke particular emotions (Cooke, 1959; Storr, 1993). However, Cooke (1959) himself believed that a piece can indeed convey the subjective experience of the composer, and Sloboda (1998) argued that music has some inherent characteristics that promote affective responses.

Examples of melodic features that have been implicated in emotional reactions include: rising contour and high pitches (cheerful, sprightly, humorous), falling contour and low pitches (sad, dignified) (Shuter-Dyson & Gabriel, 1981); appoggiatura (tearful), and unexpected changes in harmony (caused shivers) (Sloboda, 1991). Modality (major/minor key) and especially rhythm (time signature) have, however, elicited rather less comment. Dowling and Harwood (1986) cited research by Hevner in the 1930s that showed major modes to convey feelings of happiness, merriness, sprightliness and playfulness, whereas minor modes were more likely to suggest sadness, dreaminess, tenderness and yearning. Bruner (1990) offered similar observations, and Storr (1993) mentioned that Mozart was disposed to compose in the key of G minor (for example the Piano Quartet K. 478) to express melancholy.

With regard to the time-related elements, rhythm was defined by Dowling and Harwood (1986) as "...temporally extended pattern of durational and accentual relationships..." (p. 185). They cited Hevner as stating that "flowing" rhythm tends to be perceived as joyous, gay and yearning, whereas "firm" rhythm was lofty, dignified and vigorous, but also spiritual. Bruner (1990) referred to studies showing that music written in triple form (3/4 time) tends to be perceived as more smooth-flowing and relaxed, than is that in duple (2/4) or quadruple (4/4) melodies. In contrast to triple rhythm, the latter are often regarded as controlled or firm, and are said to feel more sacred and serious. Jones (1993) stated that rhythm

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appears to be an effective tool for provoking recognition, and he reported research showing that recognition for tunes was worse when rhythm was altered than when the melodic contour itself was modified.

Unpublished research by Greenbank (2000) revealed that recall of learned shapes and words was superior when participants were exposed to drum beats in quadruple rhythm, compared with either triple rhythm or arrhythmic music. It was tentatively suggested that quadruple rhythm may result in "auditory driving", and synchronisation of neural firing patterns which aids recall performance. Triple rhythm, being irregular, is unlikely to have the same effect. Greenbank argued that the improvement in recall of both verbal and spatial stimulus items provided some confirmation for the notion of dual hemisphere processing of the rhythmic component of music. This agrees with the views of Shuter-Dyson and Gabriel (1981) concerning music as a whole, but is in contrast to those of Storr (1993) and Robertson (1996) who thought that music processing is predominately a right hemisphere activity.

Although previous research has been carried out on the associations between specific musical characteristics and consistency of emotional response, there appears to be few, if any, that have investigated this in a naturalistic religious setting. Music is an important feature of religious services in many denominations and, in Europe in particular, there has been a long tradition of church music. Some composers, for example Bach, made such a significant contribution that many of his compositions have subsequently become well known and loved outside of the religious context in which they were originally written and used. It seems likely that music facilitates religious experience, which is why it has been included in religious services and ceremonies in most known cultures for as long as we have records (Batson, Schoenrade & Ventis, 1993). Whilst all music has the potential to evoke emotion, it has been suggested that religious music has a special quality, which Argyle (1990, p.269) describes as being typically "a kind of deep joy, triumph over tragedy". However, there appears to be an absence of empirical evidence to support the notion that music can convey spiritual emotions (Lowis & Hughes, 1997).

It is perhaps no surprise that music plays such an important role in religion when much of the religious rite is concerned

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with emotion and symbolism, and not only in a 'traditional' context. In Christian charismatic religious services, music is used to arouse the emotions of worshippers in similar ways as it is in shamanism, where frenetic drumming is used to work people up into states of frenzy. Christian evangelists such as Billy Graham have used highly emotional gospel hymns, sung by choirs of up to 1,500 strong, to great effect (Beit-Hallahmi & Argyle, 1997). Music and hymns clearly play a central part in group worship and shared emotions (Storr, 1993). Together with visual imagery and prayer, the music in group worship probably has a direct impact on feelings of spirituality or other religious experiences by suggesting what those present should be experiencing; thus it becomes a powerful shared emotional experience (Beit-Hallahmi & Argyle, 1997).

In view of the paucity of existing research, we decided to investigate whether feelings of spirituality experienced by worshippers might be associated with particular components of hymn tunes and, in particular, the 3/4 versus 4/4 rhythms, and Major versus Minor modes. Secondly, in considering factors that might influence feelings of spirituality, we took note of observations from previous research that there is a trend for women to report more religious experiences than do men. For example, Hay (1990) reported a gender ratio of four to three in favor of women, and Batson et al (1993) observed that women are more likely to be interested and involved in religion than are men. Consequently we decided to include a measure of gender difference in our study.

We considered a number of additional issues when planning our strategy for this study. Firstly, there are some fundamental concerns regarding any study of religion using scientific methodology. Batson et al, (1993) suggested that this is because objective, empirical observations and the use of questionnaires at best merely measure aspects of religious behaviour, not religious experience, which is part of the intensely personal, mysterious character of religion. As regards ethical issues, Batson and colleagues stated that there is a risk of causing concern among participants who may feel uneasy about having "their" religion subjected to investigation or analysis by a psychologist. Recognition of this inevitably places constraints on those who seek to study aspects of religion by the Scientific Method.

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Method

Our desire to undertake this study in the natural setting of church services inevitably influenced our methodology and design. We knew from the outset that it would be impractical to control all possible confounding variables without severe disruption to the church services. Whilst we anticipated that some manipulation of music choice would be possible, we recognised that there would be limitations because of the need for the hymns to remain appropriate to the service, for example in terms of theme. In view of these constraints, we settled on a quasi-experimental design, as this would allow the study to remain ethical and in a natural setting, whilst permitting some control of the variables of interest to us.

In deference to the limited pertinent research we had discovered, we tentatively adopted the hypotheses that hymns in minor modes would be rated higher on a measure of positive emotion and spirituality than would those in major modes, that those in quadruple time would be rated higher on this measure than would those in triple time, and that women participants would record overall higher responses than would the men.

Participants

The participants were adult attendees at four regular Sunday services at three Anglican churches in adjacent parishes in the English Midlands. As one church was used twice (although the second service had a more ecumenical flavour), some participants may have taken part in more than one survey. Although all attendees were invited to participate, not all did and, for those who took part, not everyone completed all the ratings. The participants can thus be regarded as a self-selecting opportunity sample, comprising 100 women, 37 men, and a further 4 who did not state their sex. Ages were not requested, but it is likely that the range was from greater than 18 to greater than 45 years.

Materials

A total of 16 hymns were used, comprising examples of triple-time/ major key, triple/minor, quadruple/ major, and quadruple/minor. These included the carols The First Nowell (triple/major) and We Three Kings (triple/minor), as well as the more general O For a thousand tongues to sing (quadruple/major) and Let all mortal flesh

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(quadruple/minor). These were sung by the congregations, accompanied by pipe or electronic organ according to available resources. The lead author was the organist for 10 of these hymns, and on these occasions was thus able to maintain consistency of playing style.

We needed a scale to measure the emotional and spiritual effects of the hymns, which was short and simple enough to minimise distraction from the religious rite of the services. No existing instrument appeared to be fully suitable, but we inter alia drew on the Index of Core Spiritual Experiences (INSPIRIT) of Kass, Friedman, Leserman, Zuttermeister, and Benson (1991) in order to devise a questionnaire with the following five items:

i) The music was very enjoyable

ii) I felt that the music brought me closer to God

iii) This music had a particular personal meaning (for example, it evoked memories when I heard it)

iv) The music gave me a sensation; for example a pleasant tingle down the spine, or goose-pimples

v) I felt that the music provided comfort in some way

These items are quite transparent and can thus be regarded as having adequate face validity. Kass et al (1991) obtained a significant and positive correlation between the INSPIRIT and Allport and Ross' Religious Orientation Inventory (ROI).

Each question had five-item Likert response options ranging from Strongly Disagree to Strongly Agree, with a neutral mid-point. Scoring ranged one through five respectively. There were no reversed items, as a short pilot study indicated that mixed direction questions caused some confusion to participants. If participants wished, there was opportunity for them to write qualitative comments on the reverse of the forms. Once data were available, reliability was assessed by an item analysis carried out on questionnaire scores.

Procedure

Practical arrangements were made with the incumbent clergy prior to each church service. All adults attending each of the four services were handed a batch of four questionnaires with the hymn names typed in, and a pencil, and told that an explanation would be forthcoming. Once all present were

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seated, congregation members were invited to complete a questionnaire following each of four hymns, for which time would be allocated. The voluntary nature of the exercise was emphasised, and anonymity was assured. Some details of the research hypotheses were withheld at this stage.

Each service included a hymn in each of the four mode-rhythm combinations. Unfortunately, despite all good intentions, the priest in charge sometimes positioned one or more of the hymns at a part of the service where it was impractical for the congregation to rate it, for example during procession to the communion table. Thus the number of ratings obtained for each combination was not uniform.

At the close of the service, questionnaires were collected, and the participants were told that the study was concerned with different musical characteristics, and the emotional experiences that may result from these. Questions were invited, and responded to. No adverse comments were received.

Results

All statistical analyses were computed with the aid of the computer programme Statistical Package for the Social Sciences (SPSS), version 9.0.

Scale reliability

The Cronbach alpha reliability statistic was computed for the five-item scale, and found to be a satisfactory .857 (range .599 – .734). Histogram plots of the raw scores from the four hymn mode-rhythm combinations each resembled a normal distribution, and provided confidence that parametric computations would be appropriate for subsequent statistical analyses.

Descriptive statistics

Table 1 shows the mean spiritual/emotional impact scores for each mode-rhythm combination, in descending order, and separately for all majors, minors, triples, and quadruples, also in descending order. Despite the unequal number of ratings for the combinations, we considered the data to be adequate for further analysis. It will be seen that the combination yielding the highest score is minor mode/quadruple rhythm. When scores were combined into common modes and rhythms, triple rhythm

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scored higher than quadruple, and minor mode scored higher than major.

TABLE 1

Emotional impact scores for mode-rhythm combinations of hymns

Mode/rhythm	*N*	*Mean score*	*Std deviation*
Minor/quadruple	59	18.42	3.45
Major/triple	140	18.31	3.04
Minor/triple	42	17.81	2.05
Major/quadruple	94	16.91	3.72
All triple	182	18.19	2.84
All minor	101	18.17	2.95
All major	234	17.75	3.39
All quadruple	153	17.52	3.68

Comparison of means

A one-way analysis of variance for the mode-rhythm combinations yielded a statistic of F (3) = 4.203, p = .006. Tukey's post hoc test revealed two significant differences: the major/quadruple combination was significantly lower than either the major/triple (p = .007), or the minor/quadruple (p = .025).

An independent t-test comparing scores for triple and quadruple rhythms (modes combined) yielded a statistic of t (280) = 1.84, p = .034 (1 tail). This significant result for triple rhythm is in opposition to the hypothesis that quadruple rhythms would result in higher scores than would triple. Although the minor mode group yielded higher scores than the major, the t-test showed the difference to be non-significant (p = .128, 1 tail) and thus the null hypothesis was retained.

With regard to the hypothesised gender difference, the total mean score (all conditions) for women was 18.40 (SD = 3.17), and for men 18.00 (SD = 2.70). An independent t-test confirmed there was no significant difference between these scores (p = .251, 1 tail), and nor were there any significant differences between genders on any individual mode-rhythm combination. Thus again the null hypothesis was retained.

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Discussion

Although contrary to the relevant hypothesis, based as it was on scant published evidence, this study found that hymns in triple rhythm were rated significantly higher for emotional/spiritual impact than were those in quadruple time. There was a trend for hymns in the minor mode to score higher than did those in major keys, which is in the hypothesised direction, but the difference was not significant. The very small superiority of scores for women participants over those for men was also not significant. There was no combination of mode and rhythm that was superior to all others, but the major/quadruple hymns were rated significantly lower than were the minor/quadruple and major/triple examples.

A rational explanation for the superiority of emotional/spiritual ratings for triple rhythms is hard to find. The importance of rhythm *per se* was emphasised by Gatewood (1927), whose research showed that it was regarded as perhaps the main component of music that could lead to happiness and excitement. More recently, Jones (1993) found that rhythm was more important than melody in tune recognition. Duple and quadruple rhythm is rooted in nature, in our neurological and biological makeup (for example breathing and heart beat) and in our walking, whereas in triple rhythm the beats do not obviously correspond with bodily processes (Epstein, in Robertson, 1996). Bruner (1990), however, did mention that triple rhythm is perceived as being freer flowing and relaxed, although less serious and sacred, than are the duple or quadruple varieties. It is interesting that Greenbank (2000) obtained superior recall scores for quadruple rhythm, speculating that the explanation might relate to auditory driving. In the present study, where triple rhythm yielded higher emotional impact scores, a different cognitive process would seem to be involved.

Triple time forces us to break from the formality of biorhythms, and may thus allow us greater freedom to identify with the piece we are hearing. From about the Fifteenth Century, passages in triple rhythm were intentionally introduced by composers into church music, for example to accompany celebration of the mass, to suggest The Holy Trinity, although this may not always have been obvious to the congregation. However, hymn writers over the last two hundred years probably

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did not consider this when selecting the meters for their tunes (*pers com*, Colin Touchin, Warwick University, conductor/composer).

Of course, three-quarter time is the signature of the waltz which, having developed from an earlier folk dance, swept Europe during the early nineteenth century. It thus *inter alia* has romantic conations, which could also contribute to the emotional experience felt in seemingly non-relevant contexts. Hymns, and especially carols, composed in triple time are among the most popular and well-loved, for example *Silent Night* (actually six-eight time, but feels like triple when played slowly) and *Away in a Manger*. Triple-time tunes certainly have a special feel, and further research on why they hold such an appeal is surely overdue.

The trend for the minor modality to yield higher emotional/spiritual scores than did the major, even though the difference was not statistically significant at the probabilities normally adopted, would suggest that the ratings were influenced by feelings of sadness and melancholy rather than happiness and playfulness (Dowling & Harwood, 1986; Bruner, 1990; Storr, 1993). Hymns in duple or quadruple time may be cheerful and uplifting, and as such have a very relevant place in church services which include praise and worship, but perhaps such arousal does not evoke memories or lead people to feel closer to God, as was asked in the questionnaires. Again further research in this area would be justified.

Although the study was concerned with *music* and emotion, the stimulus material was in the form of hymns and religious songs, which inevitably meant that the music was always presented, and hence experienced, with accompanying words. It was wholly impractical to attempt to manipulate this variable. Indeed, the appropriateness of the hymns for each service was determined in the main part by the words – the message or theme in keeping with that of the service – and the musical accompaniment was, to some extent, secondary. However, it was not unduly limited as a consequence of there being a reasonably broad range of hymn sources from which to choose. Nevertheless, there are likely to be implications in using words and music together. As Storr (1993) affirmed, words define the content of a hymn or song and, assuming the language is understood, the listener is guided to feel a certain way about it,

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whereas music presented separately from words renders its meaning equivocal.

The 'Group Experience' impact cannot be underestimated. Beit-Hallahmi and Argyle (1997) stated that in worship, part of the experience of emotional arousal is an enhanced feeling of union with the others. There is often a reported association between feeling close to God and feeling close to other worshippers. Storr (1993) offered an interesting perspective on this aspect by suggesting that collective singing is comforting. His explanation started from the premise that loud or unexpected noise can be unpleasant and harder to block out than, for example, an unpleasant sight. Perhaps, Storr stated, collective singing makes the participants feel more in control of their auditory environment, which is comforting and reassuring and hence facilitates religious experiences. This perhaps all the more so when one considers that many hymns sung in our churches are very familiar. As Pollard (1960) stated, hymns are an inherent part of the musical and literary consciousness of most people in this country, whatever creed or sect.

The importance of music, particularly in religion, was supported by the comments that some participants chose to write on the back of their questionnaires. These are not amenable to formal qualitative analysis, but some examples are as follows: "Music affects me very much, I get very emotional when I hear certain songs or melodies"; "Music and words (for me) cannot be dissociated, but music alone is enough to raise me up in an attitude of worship"; and, presumably if there was insufficient awareness in choosing the hymns for the day: "Some weeks, the hymns leave me with a very flat feeling". Such comments can provide valuable insight into people's attitudes towards music and religion and, in so doing, maybe stimulate further investigations into the role of music in religious services.

As might be expected from a naturalistic field setting, this study was replete with potential confounding variables. Variations in the tempo, length and dynamics of the hymns used could certainly be relevant, as could the total spiritual experience of a service. It was anticipated, however, that using 141 participants over four church services would have resulted in some extraneous variables canceling each other out. At worst the research has indicated what aspects are worthy of further investigation; at best it has suggested that some hymn time

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signatures or modes might indeed result in enhanced emotional impact. Our use of different churches does aid generalisability of our findings, although replication in different geographical areas and with different religious denominations is needed to strengthen external validity.

Previous studies, such as that by Lowis and Hughes (1997), comparing the effects of sacred and secular music, did not confirm that spirituality *per se* can be conveyed through music, but that the inherent spiritual feelings of the participants influenced how the stimulus music would be interpreted. Attempts to explain musical effects by dissecting a composition into its constituent elements destroys the very holistic nature of the piece, and rarely reveals useful data. Research suggests that emotional responses are evoked through wonderfully complex and still largely not understood processes of perception and cognition on the part of the listener. Umemoto (1990), for example, suggested that there might be a mechanism by which we comprehend music within frameworks consisting of scripts or prototypes. Perhaps, as Batson *et al* (1993) commented, music may not have the power to *produce* religious experience, but it does have the power to *facilitate* it.

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Book Review

***Nobilitas:* A Study of European Aristocratic Philosophy from Ancient Greece to the Early Twentieth Century**
Alexander Jacob
University Press of America, 2001, O-7618-1887-1.

This study surveys the philosophical arguments for monarchical and aristocratic government from Greek antiquity to the early twentieth century. Dr. Jacob has already several learned and thoughtful books and articles to his credit. Among his translations of philosophical or political classics are Edgar J. Jung´s *The Rule of the Inferior* from 1930 and Houston Stewart Chamberlain´s *Political Ideals* from 1915. Then there is his study of natural philosophy, *De Naturae Natura: A Study of Idealistic Conceptions of Nature and the Unconscious,* published by Franz Steiner Verlag, Stuttgart, in 1992.

In *Nobilitas,* first the political views of Plato and Aristotle are examined. As regards their civic duties Plato never forgets the distinction between superior and inferior. According to Plato´s *Republic,* no cessation of troubles for our states or even for the human race can be expected before philosophers become kings, or kings become philosophers. Kingship is the best form of government, provided, of course, that it is directed by law. If lawless, it turns into unbearable tyranny. The rule of the many is the weakest in every way; it is not capable of any real good or of any serious evil as compared with monarchy and aristocracy.

For Aristotle the end of politics is the good of man, but it is not sufficient to secure the good of one person only; the good of the nation is more important. Even slavery is considered natural. It is the duty of legislators to ensure the predominance of the higher and more rational aspect of the soul over the lower and irrational. War must be only for the sake of peace. i.e. for preservation of the liberty of the nation. Jacob comments, "Aristotle´s political theories are in no way democratic, in the modern sense, but, on the contrary, quite idealistic in a Platonic manner."

The case of Rome brings Jacob to Cicero, the most eloquent representative of the Republic, a staunch opponent of the demagogical – though noble – autocrat, Julius Caesar. When reading Cicero´s *De republica* and *De legibus,* we see that this fine

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and admirable *homo novus* is heavily influenced by Plato, as also by the Stoics. Cicero, too, decides on the superiority of a monarchy that is just since he perceives it as ideally representing the prevalence of reason over the passions. But it being also true that monarchy may easily deteriorate into a tyranny, Cicero suggests a remedy in a mixed form of government that includes not only the regal element but also aristocratic and democratic participation. The best political system is seen as the aristocratic Roman Senate, where government is conducted by wisdom. The worst form of government, by contrast, is identified as the democratic, because there can be nothing more horrible than the deceptive politicians who falsely assume the name of the people. The ideal law, for Cicero, is no mere invention of the human spirit, but something eternal which reigns over the entire world by virtue of the wisdom of its commandments. This law is inscribed in the minds of all enlightened men and corresponds to what we would call rationality and conscience. Reason is derived from a correct perception of the Nature of the universe, and it came into being simultaneously with the divine mind. So, in the writings of Cicero we find the continuation of the political ethic of "the divine Plato".

From Septimius Severus to Diocletian the Roman Empire gradually deteriorated to approximate oriental despotism, even though the emperors were never isolated dictators but always ruled with the support of a political elite. Later on, in spite of Christianity´s insistence on the equality of men before God, the religion of Europe in the Middle Ages did not encourage the growth of democracy. Mediaeval Germanic government mostly retained an aristocratic quality.

Among the philosophers of the Renaissance who defended monarchical rule was the Florentine aristocrat Francesco Guicciardini (1483-1540). Aristocratic and monarchical rule was preferable to popular rule, in his opinion, because the ideal prince is not subject to the petty passions which always plague the people. In his *Republique* from 1576, Jean Bodin starts from the Divine Law as the basis of the true monarchy, and insists that the king should be subject to none but to God. Much like Plato, Bodin finds the sovereign good of the republic and of each of its citizens in the intellective and contemplative virtues. To him, only a monarchy can ensure the prevalence of "harmonic justice" or the distribution of honors in accordance with the

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merit of their recipients.

In Chapter III, author Jacob considers the Age of Revolution, represented by Burke, Maistre and Vico. He points to what he calls "the inherent English desire for aristocratic government", as opposed to the two most anti-aristocratic movements in the history of Europe, viz. the French Revolution and its Russian successor. Though purportedly triggered by the economic oppression of the poor by the aristocracy, they were, according to Spengler, rather a matter of the opposition between the urban elements of commercialism, that is "money divorced from the prime values of the land", to "the powers of the blood and the tradition inherent in the blood". These revolutions also reflected the rise of the megalopolis and its mob of deracinated, dehumanised people. Money now gradually surpasses in influence intellectualism, and finally democracy and plutocracy become the same thing.

The conservative reaction to Rousseau and the French Revolution was represented by Edmund Burke (1729-97), who insisted on the importance of piety and tradition in the growth of states. For Burke, all good things in Europe depended on two things combined: the spirit of a gentleman, and the spirit of religion. To a large extent Burke´s views were shared by the French aristocrat, Count Joseph de Maistre (1753-1821). To ensure that the revolutionary sentiment did not appear again, Maistre pointed to the vital necessity of a sound spiritual educational system which has a religious or ethical basis. Maitre´s aristocratic theory is thus a modern restatement of the Platonic insistence on the identification of politics with philosophy and religion that we have already encountered earlier in Bodin *et al.* The Italian philosopher Giambattista Vico (1668-1744) represents original views on of historic processes and of the patterns of government in the world. In his view too, monarchs are not only the true representatives of the "people" but also the just distributors of privileges among the latter, regarding always the respective merit of each.

Turning to Chapter IV, we learn that the major philosophical systems in Germany from the seventeenth to the nineteenth centuries were all increasingly idealistic in their complexion and favored monarchical, authoritarian, and nation-oriented government. Kant (1724-1804) insisted on the priority of duties to rights. To him the highest life is based on

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the freedom of the will, which is not the freedom to do whatever one pleases but the higher freedom to act in accordance with moral law.

Johann Gottlieb Fichte (1762-1814), in his later writings showed an increasing preference for a Platonic philosophical state ruled neither by a hereditary aristocracy nor by the people but by enlightened scholars. Like Kant, he posited the *a priori* moral law of the universe as equivalent to the Godhead. The ideal Ruler, according to Fichte, possesses, in the first place, a living and comprehensive idea of that relation of human life which he undertakes to superintend; he knows what is its essential nature, meaning and purpose. Further, he perfectly understands the changing and adventitious forms which it may assume in reality without prejudice to its essential nature. The ideal Ruler is thus the most direct manifestation of God in the world.

The absolutism of Fichte is heightened in the writings of Hegel (1779-1831), whose glorification of the State is famous. For Hegel, the State or national community is the embodiment of rational freedom, and his political system is very much opposed to democracy. Electoral rights are restricted to those that are gifted with learning, knowledge of public affairs, and property.

When we come to Arthur Schopenhauer (1788-1860), the metaphysical and ethical conclusions of his system are all quite Platonic. Hence the similarity between his political theories and those of Fichte and Plato. Schopenhauer is not a democrat, but rather a monarchist, though opposed to the glorification of the political state as the highest purpose of human existence. Jacob concludes that we see in Schopenhauer´s political philosophy a reflection of the subjective idealism of Fichte which envisages the self-realization of man in an aristocratic disdain of personal interest and ambition and a constant desire for higher harmony of enlightened mankind.

Chapter VI reminds us that like Plato, Kant, and Fichte, the English historian Thomas Carlyle (1795-1881) insisted that moral education formed the basis of all political activity and that the government should rest in the hands of a small group of ethical aristocrats. It is through the faculty of reason that man participates in the will of God, Man is but an emblem – a Clothing or visible Garment for the divinity, cast hither like a light-particle, down from Heaven.

The Mankind Quarterly

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The political writings of the Italian historian Guiseppe Mazzini (1805-72) reveal everywhere the influence of Fichte´s idealistic philosophy of the state. His view is that the earth is "the place appointed for our labor of self-improvement, and of development towards a higher state of existence". The moral law is in God, and the French Revolution was inadequate insofar as it was a narrowly individualistic and materialistic movement.

In Italy the successor to Mazzini was Giovanni Gentile who was assassinated in 1944 by Communists. Gentile´s system represented the 20th century culmination of the subjective idealistic tradition begun by Fichte, and his political views constitute some of the most subtle and lucid applications of Fichte's idealistic philosophy to the problems of the state. All human cruelty – as in Plato and Plotinus – is the result of imperfect knowledge. In Gentile´s view, the spiritual authority and tradition of a state are best represented by a supreme individual such as the king. The person of the King is that symbolic, inviolable person which represents to the citizen the heart of the nation; it is his own true personality.

Heinrich von Treitschke (1834-96) was a representative of extreme Prussian nationalism. For him – as opposed to Hegel – the state is only the people as force, and the framework of all national life. The state is power, no individual has the right to regard the State as the servant of his own aims, while the State surely lies under the obligation to concern itself with the life of its citizens by extending to them its help and protection. The consciousness of national unity depends upon a common bond of religion, a fundamental force of the human character. The interference of alien persons was in German politics was the perceived as the cause of the disturbance of the traditional moral and spiritual ordering of society.

Although marked by a greater restraint than the political doctrines of Hitler and the National Socialists, Hegel´s view of the nation-state as the highest objective moral idea and Treitschke´s doctrine of the State as the external form of national power were direct sources of fascist totalitarianism. Friedrich Nietzsche (1844-1900) reflects the aristocratic qualities of Treitschke´s political philosophy, and his glorification of the state as a breeding ground for a race of superior people, incorporates the notion of the inherent superiority of some peoples over others. Nietzsche´s aristocratic society would

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presumably be organized in a system of mutually exclusive castes, in the manner of the ideal of ancient Aryan society. The German philosopher in fact declared his admiration for the Indo-Aryan Laws of Manu as "an incomparably intellectual and superior work, which it would be a sin against the spirit even to name in the same breath with the Bible."

Chapter VIII shows briefly how race became the principal basis of history in the writings of Gobineau, Chamberlain, Rosenberg, and Hitler. Gobineau (1816-1882) was among the first to divide mankind into three distinct races, the white, the yellow, and the black, and seeing the first as culturally superior to the others. The Aryans, who are the master-race of Nietzsche, have all along had an aristocratic temper which is reflected in their political organizations. Gobineau pointed to the caste-system of ancient India as the epitome of aristocratic society. It was his regret that Europe had never achieved a similar, lasting, social system. The French Revolution he saw as an anti-aristocratic movement, a crime against blood. For Gobineau the characteristic ethic of the Aryan race was a heroic one based on the solid foundations of honor and duty.

Like Gobineau, the English historian Houston Stewart Chamberlain (1855-1926) insisted on the radical differences between the traditions with regard to spiritual qualities. He contrasted the materialism which he portrayed as characteristic of the Semitic tradition with what he saw as the otherworldly idealism of the Aryan tradition. Thus in his magnum opus, *The Foundations of the Nineteenth Century*, "Wherever the Semitic spirit has breathed, we shall meet with this materialism – With this view of religion only practical ends are pursued, no ideal ones. It is to provide for prosperity in this world, and aims particularly at power and wealth." By contrast, he rightly or wrongly judged Indian philosophy to be idealistically aristocratic to the core. Indeed, it claimed that the highest perceptions of idealistic culture can only be instilled in those who have specific inherited or racial qualifications.

The work of Chamberlain was continued in that of Alfred Rosenberg (1893-1946), to become the ideological basis of the Nazi Party. Rosenberg's anti-Semitism perceived the materialism of the Semitic tradition as being opposed to the Indo-European one. For Rosenberg, Marxism arose from out of Jewish materialism, and constituted an attack on the more idealistic

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culture of Europe.

After a brief discussion of the concept of aristocracy in twentieth century Europe, Dr. Jacob, in a second appendix, presents the opposition between the aristocratic tradition as he sees it and what he regards as the spiritual defects of materialistic democracy. He claims that some of the harmful effects were already noted by Alexis de Tocqueville (1805-59), the author of the celebrated Democracy in America, from 1840. In a democracy men are "extremely eager in the pursuit of actual and physical gratification. As they are always dissatisfied with the position they occupy, and are always free to leave it, they think of nothing but the means of changing their fortune or increasing it. To minds thus disposed, every new method that leads by a shorter road to wealth, every machine that spares labour, every instrument that diminishes the cost of production, every discovery that facilitates pleasures or augments them, seems to be the grandest effort of the human intellect." From an essay on Aristocracy by Philippe Mairet (1886-1975) he cites this pregnant quotation: "[a] completely classless society would be a society of imbeciles."

In his Epilogue, Jacob openly states his conviction that nations which have lost their hereditary aristocratic families must constitute new aristocracies based on philosophical understanding and talent. The raison d'etre for aristocracy ultimately rests on the irreplaceable values of spiritual awareness, tradition and superior hereditary qualities as vital requisites for the survival and progress of nations.

Jacob´s book stresses the vagaries of present-day democracies, and of the obvious fact that their ways are not as ideal as they should be. He sees the vociferous superficiality of the mass media, not to speak of their vulgarity and ignorance and malignity, is a great threat to the success of the democratic experiment. The boundary between news that are reported and news that are "made" is often flimsy. How can we under such circumstances achieve the correct knowledge necessary for making the right decisions for ourselves and for the community?

In modern Europe, kings and queens, if they have survived at all, would seem to have done so by the grace of a graceless press rather than by the divine grace of a pristine God. Nobilitas has become anathema. Who will solve the problem, and how should it be solved? He sees the three religions of Abraham as

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basically hostile to the spirit of science and to nobility, and sees the extent of their influence as being beyond calculation. Freedom of spirit is too rarely found in modern academe – much less so in politics and in government. And when it comes to modern art and literature, he asks, where have Beauty and Decency gone?

More than ever was the case in the past, Jacob finds modern Western society in need of that aristocracy of virtue and talent – *virtus et ingenium* – that the Sage of Monticello understood so very well to be a necessity for the democratic experiment to succeed. The importance of virtue were realized long ago by Plato and his noble successors. But virtue is nothing if not put into practice.

Robert Holwell

True Nature: A Theory of Sexual Attraction
Michael R. Kauth
Kluwer Academic, New York, 2000

In spite of the title, this seems to be primarily a book aiming at explaining why some people are attracted to those of the same sex and others to those of the opposite sex.

Most of the book is devoted to a competently done review of the various theories that have been offered to explain homosexuality and Lesbianism. The defects in the various theories are pointed out. Most of the major papers on the origins of homosexuality seem to have been covered. Many professionals will find this summary of the literature useful.

After rejecting previous theories as being at least incomplete, the author offers his own interactional theory which attempts to combine elements from various other theories. A major novelty is an attempt to argue that same-sex erotic attraction has evolved as a way of facilitating same sex alliances. It is claimed that social organizations in early human societies were characterized by same-sex bands. No real justification for this claim is offered. Deducing early human living patterns from campsite remains and similar evidence is obviously very difficult. Kauth then argues that women who could form strong same sex alliances were better able to raise children and find mates. Likewise, men who could form strong same sex bonds would

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have an advantage in hunting and in finding and protecting mates. Kauth argues that same-sex erotic attraction is an adaptation for forming such bonds.

There is little doubt that same sex bands are an advantage and we likely have mechanisms to aid in forming them. Our brains could very well have evolved in ways which would aid the formation of such alliances, including keeping track of who has done us favors and who has hurt us. The issue is whether we have evolved mechanisms that involve erotic attractions. On the face of it, there would appear little advantage to having sexual excitement involved in friendship and mutual aid pacts. If sexual attractions were a key element in same sex alliances one might expect same sex erotic attraction to affect many more than the minority of individuals it now affects.

Krauth argues that heterozygous genes lead to sexual attractions for individuals of both sexes while inheriting the same alleles leads to either exclusive same-sex attraction, or exclusive opposite-sex attraction. He takes the view that sexual attraction to both sexes is more desirable and this implies that the heterozygotes have a reproductive advantage. The obvious problem with this theory is that if it were valid bisexuals would be relatively common and heterosexuals and exclusive homosexuals less common. However, empirical studies (especially for males) show that bisexuals are rarer than either homosexuals or heterosexuals.

True Nature is a relatively heavy read. The author devotes the first chapter to issues of definition, which contributes to the precision of the arguments but which will bore many potential readers. While the book should be of interest to those concerned with the origins of same sex attraction, there is little that will be of direct use in sexual or marital therapy..

Edward Miller

Florida's Colonial Architectural Heritage
Elsbeth K. Gordon
University Press of Florida

While the United States was primarily pioneered by English, Scots and Welsh, much of its more romantic character is owed

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to the early settlements of Spanish and French origin. California and Florida especially owe this distinctive character to the Spanish, and of these two states it is Florida which is by far the oldest. Spanish colonial architecture had a remarkable charm, and to this day many of the buildings erected in Florida still imitate the Spanish style. A thorough survey of Spanish colonial architecture in Florida is therefore extremely welcome.

In this book, author Gordon recounts a story never before fully told, she tells it ingeniously, by resurrecting the lives of the colonial designers, their personal histories, and their drawings and building technologies. Gordon shows how local materials, climate, cataclysmic events, and even faith all played a part. Readers will find that Indians had technology to build community structures able to hold 3,000 people, that the Spanish and British both erected impressive buildings embellished in the current European colonial fashion, that the plaza and streets of St. Augustine still follow the same lines today as they did when laid out in 1572 and 1598, and that this oldest surviving capital city in the United States had already undergone two urban renewals by the time the Pilgrims landed at Plymouth.

In this substantial and detailed account, Gordon draws on archaeological findings and on historical documents and drawings in archives in Spain, Cuba, Mexico, England, and the United States. Her combination of detailed scholarship, crisp writing, and abundant illustrations will reach beyond historians and scholars to embrace the wide circle of those eager to study Florida history . And it is written by an author who besides her academic qualifications is an owner-partner of a company that has restored a number of historic buildings in Florida.

John H. Anderson

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Family, Kin and City-State

Numa Denis Fustel de Coulanges

Edited and Abridged by J. Jamieson

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